

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN 15804 and ISO 14025

SGG ANTELIO[®]
SGG REFLECTASOL[®]

From 4 mm to 10 mm
Pyrolytic CVD coated glass

Date of issue : 15-09-2016
Version : V.01



EPD[®]
VERIFICATION

S-P 00885


SAINT-GOBAIN

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General information

Manufacturer:

SAINT-GOBAIN GLASS FRANCE¹
18 avenue d'Alsace
92400 Courbevoie
FRANCE

European standard EN 15804 served as core EPD			
Product / product family name and manufacturer represented	Pyrolytic CVD coated glass (SGG ANTELIO [®] , SGG REFLECTASOL [®]) produced by SAINT-GOBAIN GLASS INDUSTRY		
Declaration issued:	15-09-2016		
valid until:	15-09-2021		
Program used	INTERNATIONAL	EPD	SYSTEM
EPD registration number/declaration number:	www.environdec.com		
PCR identification	S-P 00885		
PCR review was conducted by	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)		
CPC Classification:	The technical committee of the international EPD system Chair: Massimo Marino		
Independent verification of the declaration and data, according to ISO 14025	Contact via info@environdec.com		
Third party verifier	37113 "Float glass and surface ground or polished glass, in sheets."		
Accredited or approved by	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)		
	Bureau Veritas Certification Sverige AB for the EPD process certification		
	INTERNATIONAL EPD SYSTEM Swedac Ackreditering		

¹ The manufacturing companies concerned are SAINT-GOBAIN GLASS FRANCE, SAINT-GOBAIN GLASS DEUTSCHLAND, SAINT-GOBAIN GLASS UK, SAINT-GOBAIN GLASS ITALY, SAINT-GOBAIN CRISTALLERIA, SAINT-GOBAIN GLASS POLSKA, and all glassolutions sites within the EU.

Product description

Product description and description of use

SGG ANTELIO and SGG REFLECTASOL are soda-lime silicate glass produced using the float procedure, on which a CVD coating has been applied. The glass is meant to be used in building, furniture & industrial applications.

SGG ANTELIO is a solar control glass and SGG REFLECTASOL is a reflective, solar control glass.

SGG ANTELIO and SGG REFLECTASOL glass comply with the requirements of class A of European standard EN1096.

It is manufactured by a process known as 'On-line pyrolytic coating' (or Pyrolytic Chemical Vapor Deposition) wherein a coating is applied to the glass surface by means of pyrolysis. Also known as hard coating, the process fuses precious metal oxides on the surface of the float at high temperature while the glass is in formation. This gives it a number of properties:

- Total integration with the surface of the glass,
- Strength and stability over time,
- Solar control properties and a reflective appearance.

Depending on the flat glass used (SGG PLANICLEAR / SGG PARSOL) and on the composition of this coating (SGG ANTELIO / SGG REFLECTASOL), different products can be produced, distinguishable by the thermal performance, spectrophotometric values and processing characteristics:

- SGG ANTELIO Clear: solar control glass on SGG PLANICLEAR
- SGG ANTELIO Silver: solar control glass on SGG PLANICLEAR
- SGG ANTELIO Emerald: solar control glass on SGG PARSOL green
- SGG ANTELIO Havana: solar control glass on SGG PARSOL bronze
- SGG REFLECTASOL Light Gold: reflective solar control glass on SGG PLANICLEAR
- SGG REFLECTASOL Bronze: reflective solar control glass on SGG PARSOL bronze
- SGG REFLECTASOL Green: reflective solar control glass on SGG PARSOL green
- SGG REFLECTASOL Grey: reflective solar control glass on SGG PARSOL grey
- SGG REFLECTASOL Ultra Grey: reflective solar control glass on SGG PARSOL Ultra grey
- SGG REFLECTASOL Blue: reflective solar control glass on SGG PARSOL blue

The data included in this EPD are an average of all Pyrolytic CVD coated glass produced by Saint-Gobain Glass Industry.

Performances

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

SGG ANTELIO Clear (on SGG PLANICLEAR)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	46.3	46.1	46.0	45.7	45.4
External light reflection (RLE) (%)	27.0	26.8	26.7	26.4	26.1
Energetic parameters					
Energy transmittance (ET) %	55.7	54.9	54.2	52.7	51.3
Energy absorbance (EA) %	22.6	23.7	24.8	26.9	28.9
Solar factor g	0.61	0.60	0.60	0.59	0.58

SGG ANTELIO Silver (on SGG PLANICLEAR)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	67.4	67.2	67.0	66.6	66.1
External light reflection (RLE) (%)	30.3	30.2	30.0	29.7	29.4
Energetic parameters					
Energy transmittance (ET) %	69.6	68.7	67.8	66.2	64.5
Energy absorbance (EA) %	6.6	7.9	9.2	11.5	13.7
Solar factor g	0.71	0.71	0.70	0.69	0.68

SGG ANTELIO Emerald (on SGG PARSOL Green)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	57.3	55.1	53.0	49.1	45.5
External light reflection (RLE) (%)	22.0	20.7	19.5	17.5	15.7
Energetic parameters					
Energy transmittance (ET) %	42.3	37.5	33.5	27.5	23.2
Energy absorbance (EA) %	44.1	50.2	55.1	62.5	67.8
Solar factor g	0.53	0.49	0.47	0.42	0.39

SGG ANTELIO Havana (on SGG PARSOL Bronze)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	29.3	26.4	23.8	19.4	15.8
External light reflection (RLE) (%)	14.9	13.0	11.4	9.0	7.5
Energetic parameters					
Energy transmittance (ET) %	35.0	31.7	28.8	23.7	19.6
Energy absorbance (EA) %	52.4	57.2	61.4	68.2	73.8
Solar factor g	0.47	0.45	0.43	0.40	0.37

SGG REFLECTASOL Light Gold (on SGG PLANICLEAR)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	32.4	32.3	32.2	31.9	31.7
External light reflection (RLE) (%)	47.3	47.0	46.7	46.2	45.6
Energetic parameters					
Energy transmittance (ET) %	49.6	48.8	48.1	46.7	45.3
Energy absorbance (EA) %	14.6	15.7	17.1	19.7	22.1
Solar factor g	0.53	0.53	0.52	0.52	0.51

SGG REFLECTASOL Bronze (on SGG PARSOL bronze)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	21.6	19.5	17.6	14.3	11.7
External light reflection (RLE) (%)	23.3	19.8	16.9	12.7	9.9
Energetic parameters					
Energy transmittance (ET) %	35.5	32.2	29.2	24.2	20.0
Energy absorbance (EA) %	45.6	51.6	56.8	65.0	71.2
Solar factor g	0.46	0.44	0.43	0.39	0.37

sgg REFLECTASOL Green (on sgg PARSOL green)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	27.8	26.6	25.6	23.6	21.8
External light reflection (RLE) (%)	36.7	34.4	32.2	28.4	25.2
Energetic parameters					
Energy transmittance (ET) %	25.9	22.3	19.4	15.2	12.3
Energy absorbance (EA) %	54.2	59.7	64.1	70.7	75.4
Solar factor g	0.39	0.36	0.35	0.32	0.30

sgg REFLECTASOL Grey (on sgg PARSOL grey)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	19.6	17.3	15.3	11.9	9.2
External light reflection (RLE) (%)	20.3	16.8	14.0	10.2	7.9
Energetic parameters					
Energy transmittance (ET) %	33.5	30.0	26.9	21.7	17.5
Energy absorbance (EA) %	49.0	55.2	60.4	68.7	74.7
Solar factor g	0.45	0.43	0.41	0.38	0.35

sgg REFLECTASOL Ultra Grey (on sgg PARSOL Ultra grey)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	3.4	1.9	1.1	0.4	0.1
External light reflection (RLE) (%)	4.8	4.5	4.4	4.3	4.3
Energetic parameters					
Energy transmittance (ET) %	4.4	2.6	1.5	0.5	0.2
Energy absorbance (EA) %	91.0	93.1	94.2	95.2	95.5
Solar factor g	0.26	0.25	0.24	0.23	0.23

sgg REFLECTASOL Blue (on sgg PARSOL blue)

Thickness (mm)	4	5	6	8	10
Visible parameters					
Light transmittance (LT) %	23.2	21.3	19.6	16.6	14.1
External light reflection (RLE) (%)	27.4	24.1	21.3	16.9	13.7
Energetic parameters					
Energy transmittance (ET) %	27.5	23.7	20.5	15.6	12.0
Energy absorbance (EA) %	54.3	60.5	65.5	71.3	78.5
Solar factor g	0.40	0.38	0.36	0.33	0.31

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 properties to the glazing

The above list gives the main components of the product, including the one contributing to more than 5% of any environmental impacts, if any.

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 Pyrolytic CVD coated glass 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 informations were established over the year 2014. The information collected comes from the European sites producing pyrolytic CVD coated glass (SAINT-GOBAIN GLASS INDUSTRY)
BACKGROUND DATA SOURCE	GaBi data were used to evaluate the environmental impacts.
SOFTWARE	Gabi 6 - GaBi envision SGG_EPDP tool for Building glass 1m2_2016-08-09.gmbx

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

Life cycle stages

Diagram of the Life Cycle



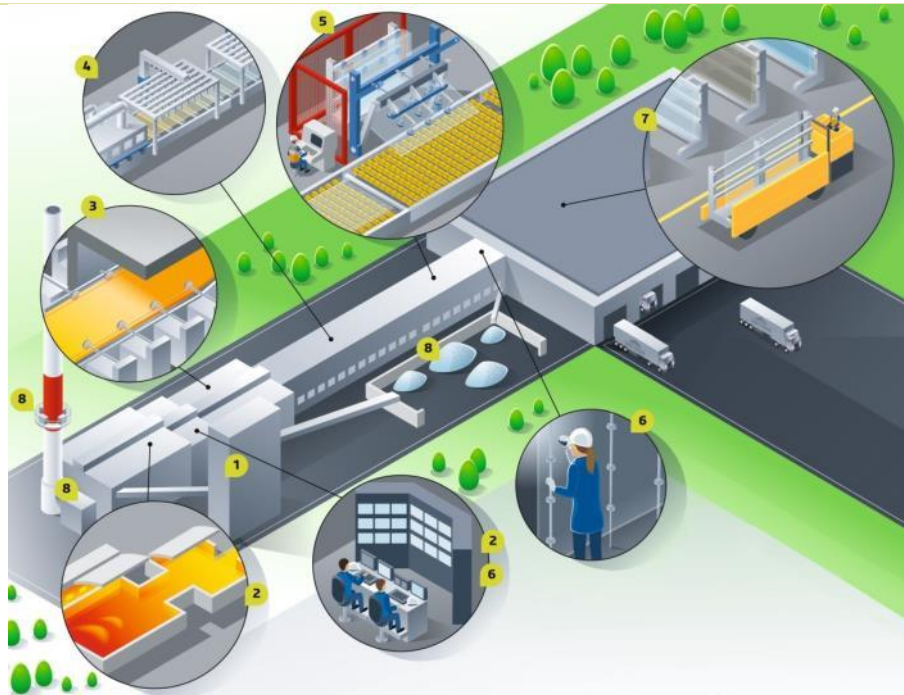
Not relevant stages: as this is a cradle to gate with options declaration stages A4, A5 and B1-B7 are not relevant.

Product stage, A1-A3

Description of the stage: For coated glass A1 to A3 represents the production of glass in the float & coater 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).

ON-LINE COATING (PYROLYTIC CVD): metal oxides are deposited onto the surface of the glass during glass production and while the glass is still in a semi-molten state, typically at 600-700 °C. A chemical reaction occurs between the metal oxide vapor and the glass surface, changing the chemical composition of the glass surface, resulting in a hard coating that strongly adheres to the glass.

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 thelehr 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.

LCA results

The table below present the environmental impacts associated with the production of 1 square meter of Pyrolytic CVD coated glass, as a mix of every coating and/or colors, for each basic glass (SGG PLANICLEAR and SGG PARSOL). This is a Cradle-to-Gate EPD. The environmental impacts of all the other stages in the life cycle of the Pyrolytic CVD coated glass are not declared (MND).

In two parts:

- SGG ANTELIO (Silver and Clear) / SGG REFLECTASOL (Light gold) on SGG PLANICLEAR
- SGG ANTELIO (Emerald & Bronze) / SGG REFLECTASOL (Green, Dark Grey, Bronze, Blue) on SGG PARSOL

ENVIRONMENTAL IMPACTS 4 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	13.3	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) <i>kg CFC 11 equiv/FU</i>	2.42E-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 (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	0.0602	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.0182	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) <i>kg Ethene equiv/FU</i>	0.00415	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	8.68E-5	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	165	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 4 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	5.83	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	5.83	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	169	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	169	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	0.997	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 - m³/FU	0.0306	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 4 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	3.83E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.292	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.00166	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 4 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.277	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS 5 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	16.3	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) <i>kg CFC 11 equiv/FU</i>	3.01E-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 (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	0.0751	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.0228	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) <i>kg Ethene equiv/FU</i>	0.00512	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	0.000108	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	200	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 5 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	7.25	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	7.25	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	206	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	206	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	1.25	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 - m³/FU	0.0382	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 5 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	4.78E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.365	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.00208	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 5 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.347	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS 6 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	19.3	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) <i>kg CFC 11 equiv/FU</i>	3.61E-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 (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	0.09	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.0273	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) <i>kg Ethene equiv/FU</i>	0.00609	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	0.00013	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	236	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 6 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	8.66	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	8.66	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	242	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	242	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	1.5	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 - m³/FU	0.0458	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 6 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	5.73E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.437	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.00249	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 6 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.416	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS 8 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	25.2	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) <i>kg CFC 11 equiv/FU</i>	4.8E-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 (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.0364	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) <i>kg Ethene equiv/FU</i>	0.00803	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	0.000173	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	307	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 8 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	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	n/a	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	315	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	315	n/a	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	1.99	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of renewable secondary fuels- MJ/FU	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of non-renewable secondary fuels - MJ/FU	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of net fresh water - m³/FU	0.061	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 8 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	7.63E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.582	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.00331	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 8 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.555	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS 10 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	31.1	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) <i>kg CFC 11 equiv/FU</i>	5.98E-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 (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	0.15	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.0455	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) <i>kg Ethene equiv/FU</i>	0.00997	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	0.000217	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	378	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 10 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	14.3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of renewable primary energy used as raw materials MJ/FU	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) MJ/FU	14.3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - MJ/FU	388	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	388	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	2.49	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 - m³/FU	0.0762	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 10 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	9.53E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.726	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.00414	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 10 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.693	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS 4 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	11.7	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) <i>kg CFC 11 equiv/FU</i>	7.18E-9	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	0.0517	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.00656	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) <i>kg Ethene equiv/FU</i>	0.00369	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	4.08E-5	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	162	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 4 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	7.05	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	7.05	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	201	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	201	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	7	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 - m³/FU	0.0355	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 4 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	2.29E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.372	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.0154	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 4 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.00075	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS 5 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	14.3	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) <i>kg CFC 11 equiv/FU</i>	8.98E-9	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	0.0645	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.00819	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) <i>kg Ethene equiv/FU</i>	0.00455	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	5.1E-5	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	196	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 5 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	8.78	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	8.78	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	245	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	245	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	8.75	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 - m³/FU	0.0443	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 5 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	2.85E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.464	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.0193	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 5 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.000938	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

sgg ANTELIO (Emerald & Bronze) / sgg REFLECTASOL (Green. Dark Grey. Bronze. Blue) on sgg PARSOL: 6 mm

ENVIRONMENTAL IMPACTS 6 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	16.8	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) <i>kg CFC 11 equiv/FU</i>	1.08E-8	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 (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	0.0773	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.00982	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) <i>kg Ethene equiv/FU</i>	0.00541	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	6.12E-5	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	231	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 6 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	10.5	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	10.5	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	289	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	289	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	10.5	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 - m³/FU	0.0531	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 6 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	3.41E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.556	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.0231	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 6 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.00112	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS 8 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	21.9	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) <i>kg CFC 11 equiv/FU</i>	1.44E-8	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 (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	0.103	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.0131	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) <i>kg Ethene equiv/FU</i>	0.00712	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	8.15E-5	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	300	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 8 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	13.9	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	13.9	n/a	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	378	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	378	n/a	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	14	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 - m³/FU	0.0708	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 8 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	4.54E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.741	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.0308	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 8 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.0015	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS 10 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Global Warming Potential (GWP) - <i>kg CO₂ equiv/FU</i>	27	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) <i>kg CFC 11 equiv/FU</i>	1.79E-8	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 (chlorofluorocarbons or halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
 Acidification potential (AP) <i>kg SO₂ equiv/FU</i>	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) <i>kg (PO₄)³⁻ equiv/FU</i>	0.0163	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) <i>kg Ethene equiv/FU</i>	0.00883	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 resources (ADP-elements) - <i>kg Sb equiv/FU</i>	0.000102	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	369	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 10 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Use of renewable primary energy excluding renewable primary energy resources used as raw materials - MJ/FU	17.4	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	17.4	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	467	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	467	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material kg/FU	17.5	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 - m³/FU	0.0884	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 10 mm															
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Hazardous waste disposed <i>kg/FU</i>	5.66E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Non-hazardous(excluding inert) waste disposed <i>kg/FU</i>	0.925	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Radioactive waste disposed <i>kg/FU</i>	0.0385	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 10 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse. recovery. recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
 Components for re-use <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for recycling <i>kg/FU</i>	0.00188	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Materials for energy recovery <i>kg/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Exported energy. detailed by energy carrier <i>MJ/FU</i>	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

LCA results interpretation

In the production of CVD coated glass, main impacts are linked to the production of glass.

In the production of the substrate for the CVD 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, 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) SGG ANTELIO® / SGG REFLECTASOL on SGG PLANICLEAR 6mm	Unit
	Global warming	19.3	Kg CO ₂ equiv/FU
	Non-Renewable resources consumption ^[1]	236	MJ/FU
	Energy consumption ^[2]	250.66	MJ/FU
	Water consumption ^[3]	0.0458	M ³ /FU
	Waste production ^[4]	0.4395	Kg/FU

^[1]: This indicator corresponds to the abiotic depletion potential of fossil resources.

^[2]: This indicator corresponds to the total use of primary energy.

^[3]: This indicator corresponds to the use of fresh net water.

^[4]: This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

Health characteristics

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

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)
CO₂ emissions: -20% (2010-2025)
Emissions of NO_x, SO₂ 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 an 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.

RESPONSIBLE SOURCING

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

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

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

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

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