AGC GLASS EUROPE

ENVIRONMENTAL
AND HEALTH PRODUCT DECLARATION

Hard coated glass range 4 mm (Planibel Stopsol, Sunergy, Low-e, Easy, Anti-Fog, Pure Comfort, Clearsight Lite)

Hard coated glass range– excluding installation accessories

In accordance with ISO 14025:2010, NF EN 15804+A2:2019 and its national supplement NF EN15804/CN:2022

July 2025

Version 1
Registration number: 20250645358
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Warning

The information contained in this declaration is provided under the responsibility of AGC Glass Europe in accordance with NF EN 15804+A2 and the national supplement NF EN 15804+A2/CN.

Any exploitation, in whole or in part, of the information provided in this document must at least be accompanied by the full reference of the FDES of origin as well as its producer, who may provide a complete copy.

The EN 15804+A2 standard of the CEN and the national supplement NF EN 15804+A2/CN serve as rules for the definition of product categories (SPC).

NOTE The literal translation of "EPD (Environmental Product Declaration)" into French is "DEP" (Environmental Product Declaration). However, in France, the term FDES (Environmental and Health Declaration Sheet) is commonly used, which includes both the Environmental Declaration and Health information for the product subject to this FDES. The FDES is therefore a "DEP" supplemented by health information.

Reading Guide

Example reading: -9.0 E -03 = -9.0 x 10-3

The following display rules apply:

- When the inventory calculation result is zero, then the value of zero is displayed.
- Abbreviation used:

  LCA: Life Cycle Assessment

  EPD: Environmental Product Declaration

  DVR: Reference Lifespan

  FDES: Environmental and Health Declaration Sheet

  PCR: Product Category Rules

  FU: Functional Unit
- The units used are specified in front of each flow: the kilogram "kg", the gram "g", the kilowatt-hour "kWh", the megajoule "MJ", the square metre "m^2", the kelvin "K", the watt "W", the kilometre "km", the millimetre "mm".

The results of environmental impacts and indicators of resource use, waste categories and outflows are presented with three significant figures and in scientific format.

All positive values (above zero) correspond to environmental impacts, while negative values (below zero) correspond to environmental benefits. This approach applies to all modules, including module D. When the value of modulus D is greater than 0, it is therefore an additional impact to be added to

the impacts of the other modules of the life cycle.

Precaution for the use of EPD for product comparison

The FDES of construction products may not be comparable if they do not comply with the NF EN 15804+A2 standard.

The NF EN 15804+A2 standard defined in § 5.3 Comparability of EPDs* for construction products, the conditions under which construction products can be compared, based on the information provided by the FDES:

"Therefore, a comparison of the environmental performance of construction products using EPD information must be based on the use of the products and their impacts on the building, and must take into account the entire life cycle (all information modules)"

NOTE 1 Outside of the environmental assessment of a building, ESDFs are not tools for comparing construction products and services.

NOTE 2 For the assessment of the contribution of buildings to sustainable development, a comparison of environmental aspects and impacts should be undertaken in conjunction with the socio-economic aspects and impacts of the building.

NOTE 3 For the interpretation of a comparison, reference values are required.

General Information

1. Manufacturer name and address

The information contained in this statement is provided under the responsibility of the manufacturer, AGC Glass Europe.

Address: Avenue Jean Monnet, 4 1348 Louvain-la-Neuve | Belgium
Contact : sustainability@eu.agc.com

2. Site(s), manufacturer or group of manufacturers or their representatives for whom the EPD is representative

This EPD is representative of the hard coating glass marketed by AGC Glass Europe in France. At the time of this declaration, 1 AGC Glass Europe site manufacture the range of hard coated glass for the European market, including the French market. The site is AGC Glass Europe Moustier-Sur-Sambre, located in Belgium at the address: Rue de la Glacerie 167, Moustier, 5190.

The results of this EPD reflect the data collected from this site, representing 100% of European production. The data reflects the calendar year 2023.

3. System Boundaries

From cradle to grave, with module D.

4. Type of EPD

Individual.

5. Verifier

This EPD has been verified by Franck Morin (Nobatek), auditor authorised by AFNOR Normalisation for the verification of environmental and health declarations in the construction sector.

6. Programme

This EPD has been produced within the framework of the Environmental and Health Declaration Program for Construction Products: "FDES INIES Program".

Site internet : http://www.inies.fr

The body in charge of this program is the HQE Association, whose address is:

The HQE Association, 4 avenue du Recteur Poincaré – 75016 Paris – France

7. Publication date

This EPD was published in July 2025.

8. Validity end date

The validity of this EPD is 5 years from 31 December of the year of its publication. It is therefore valid until December 31, 2030.

9. Commercial reference of the products

This EPD is a Product range EPD, covering the full range of AGC hard coated glass products. The products covered are hard coated glass, with a 4mm thick soda-lime flat glasses substrate. These ranges represent actual products marketed by AGC Glass Europe and can be seen in the Table below.

Table 1 : Hard coated glass range covered by this EPD.

Product range		
Product Name	**Coating type**	**Coating properties**
Planibel Stopsol Classic	Spray	Solar control
Planibel Stopsol SilverLight	CVD	Solar control
Planibel Stopsol Supersilver	CVD	Solar control
Planibel Sunergy	CVD	Solar control
Planibel A	CVD	Low-e
Planibel G	CVD	Low-e
Planibel G fasT	CVD	Low-e
Planibel Pure Comfort 14	CVD	Low-e
Planibel Pure Comfort 10	CVD	Low-e
Planibel Clearsight Lite	CVD	Antireflective
Planibel Clearsight Lite Comfort	CVD	Antireflective
Planibel Anti-Fog	CVD	Antifog
Planibel Easy	CVD	Easy-maintenance & anti-microbial

The environmental results presented in this EPD are based on a weighted average of the volumes of this products range.

10. Scope of validity

This EPD only covers products from the above-mentioned ranges with a thickness of 4 mm. Other thicknesses are marketed by AGC Glass Europe for hard coated products, but these are not directly covered by this EPD.

11. Independent external verification

Independent external verification carried out according to the ISO 14025 (2010) compliant environmental declaration program by:

The NF EN 15804+A2 standard of October 2022 of CEN serves as the SPC.
Independent verification of declaration and data in accordance with EN ISO 14025:2010 ☐ Internal ☒ External
Third-Party Verification: Franck Morin, auditor authorised by AFNOR Normalisation for the verification of environmental and health declarations in the construction sector.
ISO 14025 compliant program registration number: 20250645358
Date of 1st publication: 20/07/2025
Verification date: 07/2025
Validity period: 31/12/2030

• Description of the business unit and product

1. Description of the functional unit

To provide the function of 1 m^2 of flat glass used in construction or furnishing for a lifespan of 30 years. The reference flow is a 10 kg hard coated corresponding to 4 mm thick.

Additional technical characteristics are not considered in the definition of the functional unit, but they are shown in Table 14 for the full range of hard coated glass covered with this EPD.

Note: The product reference life (DVR) is set at 30 years. This duration does not reflect the actual lifespan which is generally set by the lifespan and renovation of a building. It is simply a matter of taking into account that beyond 30 years it is legitimate to consider that redevelopment may take place. The DVR does not refer to the warranty either.

2. Product and Packaging Description

The AGC product that is the subject of this declaration is a 4 mm hard coated glass, consisting of an 4 mm soda-lime flat glass with a coating layer applied on the surface of the glass pane.
This product is defined by the NF EN 572-9:2004 standard "Glass in construction. Basic soda-lime silicate glass. Conformity assessment.
The products in the hard coating range also comply with the requirements of the following standards:

- NF EN 1096-1 – Glass in building – Coated glass – Part 1: Definitions and classification;
- NF EN 1096-2 - Glass in building – Coated glass – Part 2: Requirements and test methods for class A, B and S coatings;
- NF EN 1096-4 - Glass in building – Coated glass – Part 4: Evaluation of conformity/Product standard

All hard coated glass products have the CE marking in accordance with the NF EN 572-9 standard and are produced in ISO 9001 and ISO 14001 certified factories.
For more information https://agc-yourglass.com/

3. Description of the use of the product (scope of application)

Hard coated glass is intended for use on facades in buildings and construction works. It is also used in other applications rather than only in the construction fields (e.g. glass doors for commercial refrigerator or glass doors for the oven). Although, the presents study covers only the use of hard coated glass in the construction sector. Har coated glass for buildings can be used in various applications. In many cases, hard coated glass is integrated into a product with an additional degree of processing (insulating glass, laminated glass, etc.). The impacts related to these processing steps are not included and must be added if they occur (i.e. material consumption, cutting yield, additional transport, etc.).

4. Main performance of the functional unit

The different ranges of hard coated glass in 4 mm have different performances depending on the type

of coating applied on the surface. The functional unit always represents the function of 1 m^2 of flat glass used in construction or furnishing for a lifespan of 30 years. Hard coated glass is used in buildings for application where is required by regulations to have energy and light control of the window (thermal insulation, light transmittance and solar factor). Performance indicators are discussed in the next section.

Coated glass has no particular feature regarding the resistance to fire and shocks (break-in, firearm, explosion). Therefore, no performance is reported.

5. Other technical features not included in the functional unit

Key performance indicators not included in the description of the functional unit, although important, are visible for each of the hard coated glass ranges at the Table 14 annexed to this EPD.

6. Description of the main components and/or materials of the product

Despite the differences in terms of properties and functionalities between the different hard coating ranges, the hard coated glass has the same basic components composition and are all 4 mm thick soda-lime glass.

Table 2: Composition of a 4 mm pyrolytic coated glass.

Product components	Composition
Glass	**Soda lime flat glass**
Mass	10 kg
Coating layer	**layers of metals and oxide deposited on the surface of the glass**

7. Substances on the candidate list according to the REACH Regulation (if greater than 0.1% by mass)

On the date of issue of this declaration, the products of the hard coating ranges subject to this declaration do not contain substances from the candidate list according to the REACH regulation incorporated at more than 0.1%.

8. Distribution channel

This declaration on unprocessed flat glass is mainly made for professional customers (B2B). The target audience is therefore mainly B2B, although this document can also be used by end consumers (B2C).

9. Description of the reference service life

The reference service life (DVR) of glass is 30 years.

Table 3: Descriptive parameters of the reference conditions for the use of the product and to justify the DVR.

Parameter	Value
Baseline service life	30 years
Theoretical parameters of application (if imposed by the manufacturer), including references to appropriate practices	This information is contained in the NF DTU 39:2006 standard "Building works - Glazing-mirror work" which defines the specifications for the implementation of mirror work and the installation of glass products (new works, renovation, rehabilitation, maintenance) carried out on site in all types of buildings.
Presumed quality of workmanship, when the installation is in accordance with the manufacturer's instructions	This information is contained in the NF DTU 39:2006 standard "Building works - Glazing-mirror work" which defines the specifications for the implementation of mirror work and the installation of glass products (new works, renovation, rehabilitation, maintenance) carried out on site in all types of buildings.
Outdoor environment (for outdoor applications), e.g. weather, pollutants, UV and wind exposure, building orientation, shading, temperature	
Indoor environment (for indoor applications), e.g. temperature, humidity, chemical exposure	
Conditions of use, e.g. frequency of use, mechanical exposure	
Maintenance, e.g. required frequency, type and quality, and replacement of replaceable components	

10. Biogenic Carbon Content (Stock C)

The float glasses covered by this declaration do not contain biogenic carbon. The biogenic carbon stock (C stock) is therefore 0 kg C/UF. No final packaging is taken into account in this EPD, which implies a declared zero biogenic carbon content for the packaging.

Table 4: Biogenic carbon content.

Biogenic carbon content	Value Per Functional Unit
Biogenic carbon content of the product (at the factory gate)	0 kg C
Biogenic carbon content of the associated packaging (at the factory gate)	0 kg C

• Life Cycle Stages

The environmental assessment is a cradle-to-grave, with Module D study.
The life cycle stages relating to the installation (A5) and the implementation life stages (B1-B7) are modelled based on the scenarios defined in EN 17074:2019.
The most impactful process is the supply of raw materials and more particularly the production of the flat glass used to produce pyrolytic coated glass.

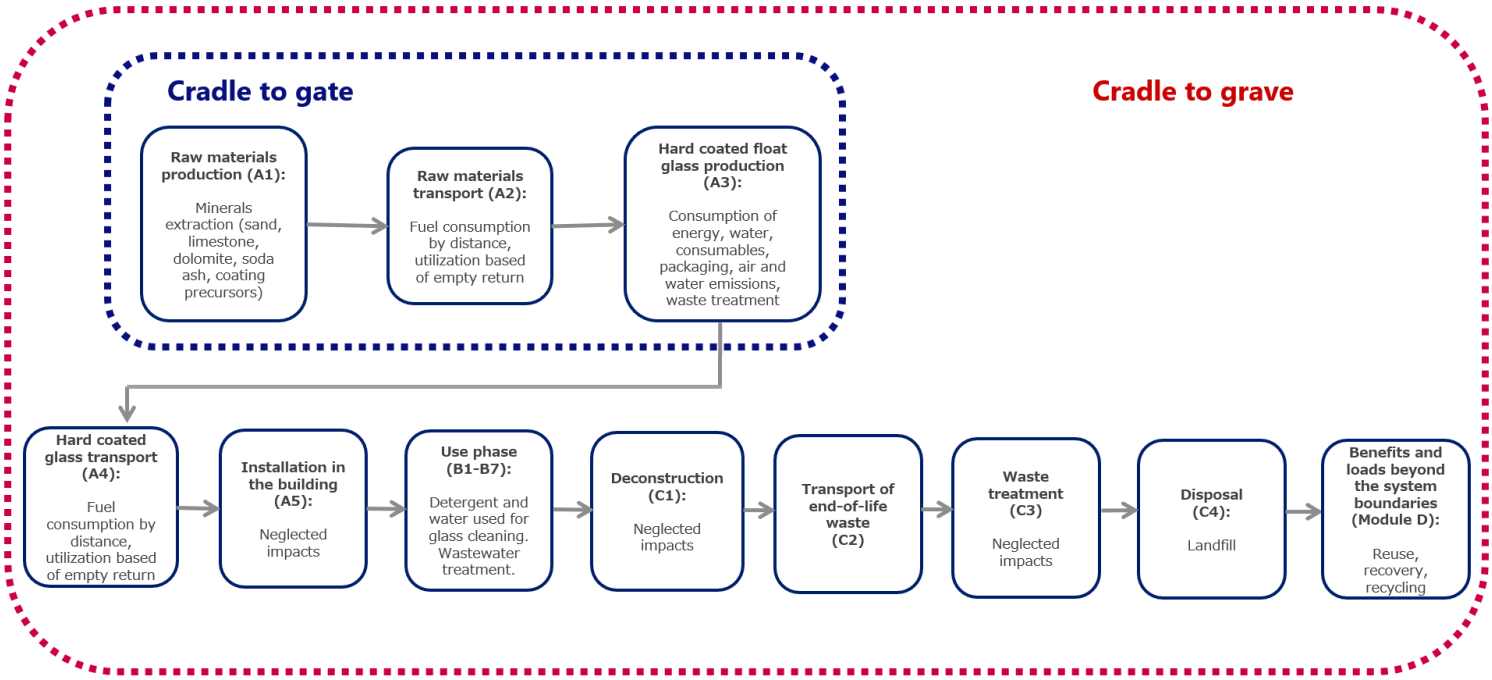

Figure 1: System overview.

	Production stage	Construction Stage		Stage of use							End of Life Stage				Benefits and Burdens Beyond System Boundaries
	Total production from A1 to A3	A4 Transports	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B4 Rehabilitation	B6 Energy Use	B7 Water Use	C1 Deconstruction/Dem	C2 Transports	C3 Waste Treatment	C4 Elimination	D
Declared Modules	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Figure 2: Visual description of the system boundaries (X = included in the LCA).

Production stage, A1-A3

Module A1-A3 takes into account the production and transport of inputs, for the production of hard coated glass. It also includes the consumptions and emissions related to the production process of the different sites such as raw materials (mentioned above), energy (electricity, natural gas), water and waste.

The hard coated glass manufacturing process consists of the following steps:

- Float glass manufacturing,
- On the same line where the glass is produced, a coating layer is applied on the glass substrate. After the glass leaves the bath of molten tin, one or more coating machines, located above the ribbon of glass near the end of the bath, release a mixture of gases. Under high temperatures, the gases react to form a solid substance that is deposited on the surface of the hot glass. In case of spray coating, the process is located just after the float line (tin bath), while in the case of CVD the coating process happen when the glass is still inside the tin bath. The resulting coating is hard, uniform, extremely thin and with a high resistance to scratches.
- The glass ribbon is then cooled in a controlled atmosphere to give the glass the desired characteristics and then cut into panels measuring 6m by 3.21m.

In addition to these steps, the production of intermediate packaging for transport to the glass processor has been taken into account in module A1-A3, as well as the end-of-life of these packaging.

Allocations

The production impacts of flat glass are allocated per ton of flat glass produced. The impacts per m^2 are then calculated based on the thickness of the flat glass used and the density of the glass. This allocation complies with the EN 17074:2019 sectorial standard.

Recycled content (allocation) and/or biomass balance (BMB) allocation approaches such as the "mass balance credits" method and/or the "Book and Claim" method were not used, as specified in the standard ISO 22095.

All inputs and outputs have been considered in the EPD as far as possible. No known data were intentionally excluded as part of this assessment.

Construction stage, A4-A5

This step takes into account the transport of the flat glasses from the production site to the construction site as well as the installation on site. No losses are taken into account during the construction process.

1. Parameters for transport to the construction site

The transport considered in this study is the average delivery distance from AGC Glass Europe's float production sites. This transport therefore corresponds to the transport of glass from AGC Glass Europe's factories to its direct customers. The transport is carried out by inloader trucks, dedicated to the transport of glass panels.

Table 5: Parameters relating to the transport of the glass product.

Parameter	Value	Unity | Description
Vehicle	24,7	Ton | Diesel Truck - Euro 5 – Cargo, 40 t
Distance to construction site	504	kilometre
Capacity utilization (including no-load returns)	87,5	%
Density of products transported	2500	kg/m^3
Coefficient of volumetric	1	

2. Parameters for installation in the building

No ancillary equipment is taken into consideration for the installation of the glass. The end-of-life of the product packaging is included in module A3, as specified by the EN 17074:2019 standard.

▪ Usage stage (excluding potential savings), B1-B7

The only module considered at the implementation life stage is the one relating to maintenance (B2). This corresponds to the cleaning of the glass surface with a solution of water and glass cleaner.

The parameters relating to the washing of glazing products are defined in the EN 17074:2019 categorical standard. The average annual water consumption from the network is 0.2 litres per m² of glass (i.e. 6 litres/m² during the reference life), to which is added a quantity of 10 g/m² of detergent (300 g/m² during the reference life). All this water is considered polluted and discharged to a wastewater treatment plant.

Table 6: Maintenance-related settings.

Parameter (for the entire service life)	Value	Unity | Description
Maintenance Process	Wash with detergent and water	
Net Fresh Water Consumption During Maintenance	0,006	m^3/UF
Detergent Consumption	0,3	kg/UF
Wastewater treatment	0,006	m^3/UF

Repair (B3), replacement (B4) and rehabilitation (B5) are not considered. Flat glasses do not require these operations during their lifespan under normal use. Finally, the product does not cause any consumption or emissions in terms of its use (B1).

This scenario is representative of a construction site located in Europe (including the case of a site in France).

- ## End-of-Life Stage, C1-C4

The end-of-life of float glass takes include the following steps:

- C1: deconstruction;
- C2: transport to the treatment site;
- C3: waste treatment;
- C4: landfill of demolition waste.

The end-of-life scenario considered in this EPD is inspired by the one described and recommended in the national supplement NF EN 15084+A2/CN:2022 for glass products. This scenario is explained in the table below.

Table 7: End-of-life settings.

Parameter	Value	Unit | Description
Proportion of glass sent to landfill	100	%
Individually collected waste	10	kg/FU
Mixed collected waste	0	kg
Reuse	0	kg
Recycling	0	kg
Energy recovery	0	kg
Disposal	10	kg/FU
Transportation to landfill, truck	50	kilometre

This transport is carried out by means of diesel trucks of the EURO 5 class with a payload of 24.7 tons.

The inputs/outputs not taken into account in this assessment correspond to the possible energy consumption related to dismantling and demolition (C1), as recommended by the EN 17074:2019 standard.

- ## Benefits and Burdens Beyond System Boundaries (Module D)

The product studied in this study contains a proportion of recycled glass (external cullet) but the end-of-life scenario of the product does not take into account any recycling, therefor module D is declared as zero.

• Information for Life Cycle Assessment Calculation

Table 8: Information for the calculation of the life cycle assessment.

SmPC Used	ISO 14025 :2010 NF EN 15804+A2:2019 NF EN 15804+A2/CN:2022 EN 17074:2019 (As a source of information because it is not consistent with NF EN 15804+A2)
System Boundaries	From cradle to grave with module D
Allocations	Mass
Geographical representativeness and temporal representativeness of primary data	**Geographic** 1 European production site of AGC Glass Europe, representing 100% of hard coated glass European production for the European market, specifically including the French market. **Time** Primary data collected for the whole 2023. **Technological** Primary input-output and transport data for the calculation of the LCI were collected from AGC's production site located in Belgium, representing 100% of Pyrolytic coating European production.
Geographical representativeness and temporal representativeness of background data	The secondary data is mainly from the 2024.1 database of the LCA for Experts LCA software 10.7.1.28. LCA for Experts was also used for life cycle modelling and indicator calculation. For this purpose, the EN 15804+A2 indicator set with characterization factors based on EF 3.1 was used. The background data used was collected less than 10 years. The background data source are primarily Sphera 2024.1 with some data from Ecoinvent 3.9.1.
Cut-off Criteria	Also known material and energy flows of the product and its packaging are accounted. In case of insufficient input data or data gaps the cut-off criteria of 1% of primary energy usage and 1% of total mass input is used. In total the neglected processes do not exceed 5% of energy usage and mass. metal stillages.
Energy Modelling	The electricity mix corresponds to the national residual mixes of the countries where AGC Glass Europe production sites for the float and the hard coated glass are located. The emission factor of this mix is 0.392 kg CO_2 eq./kWh. Only renewable electricity self-generated and consumed by AGC

	Glass Europe is taken into consideration in this study. The entire electricity in the grid is modelled on the base of national residual mixes. Similarly, natural gas consumption corresponds to the natural gas supply mix of the same countries where AGC Glass Europe produces float and hard coated glass.
Variability in results	The variability of the results was studied for the entire life cycle stages to verify that for both the hard coating production technologies, the variability of the results is less than 35% for the control indicators, according to the NF EN 15804+A2/CN:2022 standard: – Global warming: maximum variability of 7% and minimum variability of 2% – Non-renewable primary energy use excluding non-renewable primary energy resources used as feedstocks: maximum variability of 6% and minimum variability of 2% – Non-hazardous waste disposed of: maximum variability of 0.9% and minimum variability of 0.3%

- Life Cycle Assessment results

Table 9: Baseline environmental impacts.

BASELINE ENVIRONMENTAL IMPACT INDICATORS															
Environmental Impacts	Production	Construction		Use							End of Life				D Benefits and burdens beyond the boundaries of the system
	A1 / A2 / A3	A4 Transports	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Energy Consumption	B7 Water Use	C1 Deconstruction / Demolition	C2 Transports	C3 Waste Treatment	C4 Elimination	
Climate Change - Total *kg CO_2 eq./FU*	1.28E+01	3.48E-01	0	0	1.10E+00	0	0	0	0	0	0	2.07E-02	0	1.50E-01	0
Climate Change – Fossil *kg CO2 eq./FU*	1.28E+01	3.26E-01	0	0	3.01E-01	0	0	0	0	0	0	1.94E-02	0	1.50E-01	0
Climate Change – Biogenic *kg CO_2 eq./FU*	5.32E-02	1.82E-02	0	0	3.75E-01	0	0	0	0	0	0	1.09E-03	0	-1.03E-03	0
Climate Change - Land Use and Land Use Change *kg CO_2 eq./FU*	7.54E-03	3.02E-03	0	0	4.26E-01	0	0	0	0	0	0	1.80E-04	0	8.98E-04	0
Ozone depletion *kg of CFC 11 eq./FU*	5.78E-09	2.86E-14	0	0	3.15E-08	0	0	0	0	0	0	1.70E-15	0	4.04E-13	0
Acidification *mole of H+ eq./FU*	6.49E-02	1.15E-03	0	0	4.02E-03	0	0	0	0	0	0	6.85E-05	0	1.06E-03	0
Aquatic eutrophication, freshwater *kg of P eq./FU*	9.37E-05	1.19E-06	0	0	1.28E-04	0	0	0	0	0	0	7.09E-08	0	3.40E-07	0
Aquatic eutrophication, marine *kg N eq./FU*	1.54E-02	5.33E-04	0	0	4.27E-03	0	0	0	0	0	0	3.17E-05	0	2.74E-04	0
Terrestrial eutrophication *mole of N eq./FU*	1.81E-01	5.98E-03	0	0	1.48E-02	0	0	0	0	0	0	3.56E-04	0	3.01E-03	0
Photochemical ozone formation *kg NMCOV eq./FU*	4.03E-02	1.04E-03	0	0	2.08E-03	0	0	0	0	0	0	6.19E-05	0	8.37E-04	0
Depletion of abiotic resources	9.29E-06	2.12E-08	0	0	5.04E-06	0	0	0	0	0	0	1.26E-09	0	9.70E-09	0

BASELINE ENVIRONMENTAL IMPACT INDICATORS															
Environmental Impacts	Production	Construction		Use							End of Life				D Benefits and burdens beyond the boundaries of the system
	A1 / A2 / A3	A4 Transports	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Energy Consumption	B7 Water Use	C1 Deconstruction / Demolition	C2 Transports	C3 Waste Treatment	C4 Elimination	
(minerals and metals)[1] *kg Sb eq./FU*															
Depletion of abiotic resources (fossil fuels)[1] *MJ/FU*	1.46E+02	4.44E+00	0	0	3.64E+00	0	0	0	0	0	0	2.64E-01	0	1.97E+00	0
Water Requirement[1] *m^3 of deprivation eq. in the world /FU*	1.56E+00	3.76E-03	0	0	1.65E+00	0	0	0	0	0	0	2.24E-04	0	1.71E-02	0

Table 10: Resource utilization.

USE OF RESOURCES															
Environmental Impacts	Production	Construction		Usage							End of Life				D Benefits and burdens beyond the boundaries of the system
	A1/A2/A3	A4 Transports	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Energy Consumption	B7 Water Use	C1 Deconstruction / Demolition	C2 Transports	C3 Waste Treatment	C4 Elimination	
Use of renewable primary energy, excluding renewable primary energy resources used as feedstock - *MJ/FU*	1.03E+01	3.14E-01	0	0	1.79E+01	0	0	0	0	0	0	1.87E-02	0	3.44E-01	0
Use of Renewable Primary Energy Resources as Materials - *MJ/FU*	2.67E-05	0.00E+00	0	0	0.00E+00	0	0	0	0	0	0	0.00E+00	0	0.00E+00	0

[1] The results of this environmental impact indicator should be used with caution because the uncertainties in these results are high or because experience with this indicator is limited.

USE OF RESOURCES

Environmental Impacts	Production	Construction		Usage							End of Life				D Benefits and burdens beyond the boundaries of the system
	A1/A2/A3	A4 Transports	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Energy Consumption	B7 Water Use	C1 Deconstruction / Demolition	C2 Transports	C3 Waste Treatment	C4 Elimination	
Total use of renewable primary energy resources (primary energy and primary energy resources used as feedstock) - *MJ/FU*	1.03E+01	3.14E-01	0	0	1.79E+01	0	0	0	0	0	0	1.87E-02	0	3.44E-01	0
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as feedstock - *MJ/FU*	1.46E+02	4.45E+00	0	0	3.64E+00	0	0	0	0	0	0	2.65E-01	0	1.97E+00	0
Use of non-renewable primary energy resources as raw materials - *MJ/FU*	0.00E+00	0.00E+00	0	0	5.94E-01	0	0	0	0	0	0	0.00E+00	0	0.00E+00	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as feedstock) - *MJ/FU*	1.46E+02	4.45E+00	0	0	4.23E+00	0	0	0	0	0	0	2.65E-01	0	1.97E+00	0
Use of secondary material - *kg/FU*	9.66E-01	0.00E+00	0	0	0.00E+00	0	0	0	0	0	0	0.00E+00	0	0.00E+00	0
Use of Renewable Secondary Fuels - *MJ/FU*	0.00E+00	0.00E+00	0	0	0.00E+00	0	0	0	0	0	0	0.00E+00	0	0.00E+00	0
Use of Non-Renewable Secondary Fuels - *MJ/FU*	0.00E+00	0.00E+00	0	0	0.00E+00	0	0	0	0	0	0	0.00E+00	0	0.00E+00	0
Net Freshwater Use - m^3/*FU*	4.15E-02	3.46E-04	0	0	3.84E-02	0	0	0	0	0	0	2.06E-05	0	5.23E-04	0

Table 11: Waste categories.

WASTE CATEGORY															
Environmental Impacts	Production	Construction		Usage							End of Life				D Benefits and burdens beyond the boundaries of the system
	A1/A2/A3	A4 Transports	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Energy Consumption	B7 Water Use	C1 Deconstruction / Demolition	C2 Transports	C3 Waste Treatment	C4 Elimination	
Hazardous waste disposed - *kg/FU*	2.63E-08	1.65E-11	0	0	3.26E-11	0	0	0	0	0	0	9.81E-13	0	4.91E-10	0
Non-hazardous waste disposed - *kg/FU*	7.10E-01	6.41E-04	0	0	5.97E-03	0	0	0	0	0	0	3.82E-05	0	1.00E+01	0
Radioactive waste disposed - *kg/FU*	3.74E-03	5.75E-06	0	0	3.05E-06	0	0	0	0	0	0	3.43E-07	0	2.07E-05	0

Table 12: Outgoing flows.

OUTGOING FLOWS															
Environmental Impacts	Production	Construction		Usage							End of Life				D Benefits and burdens beyond the boundaries of the system
	A1/A2/A3	A4 Transports	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Energy Consumption	B7 Water Use	C1 Deconstruction / Demolition	C2 Transports	C3 Waste Treatment	C4 Elimination	
Components for reuse - *kg/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for recycling - kg/FU	9.30E-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery - *kg/FU*	1.75E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electrical power supplied to the outside - *MJ/FU*	8.44E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0

OUTGOING FLOWS															
Environmental Impacts	Production	Construction		Usage							End of Life				D Benefits and burdens beyond the boundaries of the system
	A1/A2/A3	A4 Transports	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Energy Consumption	B7 Water Use	C1 Deconstruction / Demolition	C2 Transports	C3 Waste Treatment	C4 Elimination	
Steam energy supplied to the outside - *MJ/FU*	1.53E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas and process energy supplied externally - *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 13: Aggregation of the different modules to create a "Total per stage" or "Total Life Cycle".

Aggregation of the different modules to achieve a "Total per stage" or "Total Life Cycle"						
Impacts/Flux	Production stage	Construction stage	Stage of use	End-of-life stage	Total Life Cycle	D Benefits and burdens beyond the boundaries of the system
Baseline environmental impact indicators						
Climate change - Total *kg CO_2 eq./FU*	1.28E+01	3.48E-01	1.10E+00	1.70E-01	1.44E+01	0
Climate change – Fossil *kg CO_2 eq./FU*	1.28E+01	3.26E-01	3.01E-01	1.69E-01	1.36E+01	0
Climate change – Biogenic *kg CO_2 eq./FU*	5.32E-02	1.82E-02	3.75E-01	5.64E-05	4.47E-01	0
Climate change - Land cover and land cover change *kg CO_2 eq./FU*	7.54E-03	3.02E-03	4.26E-01	1.08E-03	4.38E-01	0
Ozone depletion *kg of CFC 11 eq. /FU*	5.78E-09	2.86E-14	3.15E-08	4.05E-13	3.73E-08	0
Acidification *mole of H+ eq. /FU*	6.49E-02	1.15E-03	4.02E-03	1.13E-03	7.12E-02	0
Aquatic eutrophication, freshwater *kg P eq./FU*	9.37E-05	1.19E-06	1.28E-04	4.11E-07	2.23E-04	0

Aggregation of the different modules to achieve a "Total per stage" or "Total Life Cycle"

Impacts/Flux	Production stage	Construction stage	Stage of use	End-of-life stage	Total Life Cycle	D Benefits and burdens beyond the boundaries of the system
Aquatic eutrophication, marine *kg N eq./FU*	1.54E-02	5.33E-04	4.27E-03	3.05E-04	2.05E-02	0
Terrestrial eutrophication *mole of N eq./FU*	1.81E-01	5.98E-03	1.48E-02	3.37E-03	2.05E-01	0
Photochemical ozone formation *kg NMCOV eq./FU*	4.03E-02	1.04E-03	2.08E-03	8.99E-04	4.43E-02	0
Depletion of abiotic resources (minerals and metals)[1] *kg Sb eq./FU*	9.29E-06	2.12E-08	5.04E-06	1.10E-08	1.44E-05	0
Depletion of abiotic resources (fossil fuels)[1] *MJ/FU*	1.46E+02	4.44E+00	3.64E+00	2.24E+00	1.56E+02	0
Water requirement[1] *m^3 of deprivation eq. in the world /FU*	1.56E+00	3.76E-03	1.65E+00	1.74E-02	3.23E+00	0
Resource Utilization						
Use of renewable primary energy, excluding renewable primary energy resources used as feedstock - MJ/FU	1.03E+01	3.14E-01	1.79E+01	3.63E-01	2.89E+01	0
Use of Renewable Primary Energy Resources as Materials - MJ/FU	2.67E-05	0.00E+00	0.00E+00	0.00E+00	2.67E-05	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as feedstock) - *MJ/FU*	1.03E+01	3.14E-01	1.79E+01	3.63E-01	2.89E+01	0
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as feedstock - MJ/FU	1.46E+02	4.45E+00	3.64E+00	2.24E+00	1.56E+02	0

[1] The results of this environmental impact indicator should be used with caution because the uncertainties in these results are high or because experience with this indicator is limited.

Aggregation of the different modules to achieve a "Total per stage" or "Total Life Cycle"

Impacts/Flux	Production stage	Construction stage	Stage of use	End-of-life stage	Total Life Cycle	D Benefits and burdens beyond the boundaries of the system
Use of non-renewable primary energy resources as raw materials - MJ/FU	0.00E+00	0.00E+00	5.94E-01	0.00E+00	5.94E-01	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as feedstock) - *MJ/FU*	1.46E+02	4.45E+00	4.23E+00	2.24E+00	1.57E+02	0
Use of secondary material - kg/FU	9.66E-01	0.00E+00	0.00E+00	0.00E+00	9.66E-01	0
Use of Renewable Secondary Fuels - MJ/FU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Use of Non-Renewable Secondary Fuels - MJ/FU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Net Freshwater Use - m^3/FU	4.15E-02	3.46E-04	3.84E-02	5.44E-04	8.08E-02	0
Waste Category						
Hazardous Waste Disposed of - *kg/FU*	2.63E-08	1.65E-11	3.26E-11	4.92E-10	2.68E-08	0
Non-Hazardous Waste Disposed of - *kg/FU*	7.10E-01	6.41E-04	5.97E-03	1.00E+01	1.07E+01	0
Radioactive waste disposed of - *kg/FU*	3.74E-03	5.75E-06	3.05E-06	2.10E-05	3.77E-03	0
Outgoing flows						
Components for reuse - *kg/FU*	0	0	0	0	0	0
Materials for recycling - *kg/FU*	9.30E-01	0	0	0	9.30E-01	0
Materials for energy recovery - *kg/FU*	1.75E-02	0	0	0	1.75E-02	0
Electrical power supplied to the outside - *MJ/FU*	8.44E-03	0	0	0	8.44E-03	0
Steam energy supplied to the outside - *MJ/FU*	1.53E-02	0	0	0	1.53E-02	0
Gas and process energy supplied externally - *MJ/FU*	0	0	0	0	0	0

• Additional information on the release of hazardous substances into indoor air, soil and water during the use stage

1. Indoor air

- VOC and formaldehyde emissions

Not applicable.

- Behaviour in the face of fungal and bacterial growth

No tests have been carried out on the behaviour of the product in relation to fungal and bacterial growth.

In addition, the product is made of glass, a mineral and inert material. It is not, in itself, a growth medium for microorganisms.

- Naturally occurring radioactive emissions from construction products

No tests were conducted for naturally occurring radioactive emissions.

- Fibre and particulate emissions

No tests were conducted for fibre and particulate emissions.

2. Soil and Water

The product is not in contact with water intended for human consumption.

No tests have been carried out on the sanitary quality of the water in contact with the product during its working life.

• Product contribution to quality of life inside buildings

1. Product characteristics involved in the creation of hygrothermal comfort conditions in the building

The relevant technical characteristics of the 4 mm thick float glass products regarding hygrothermal comfort are shown in the Table 14.

2. Product characteristics involved in the creation of acoustic comfort conditions in the building

The relevant technical characteristic of 4 mm thick hard coated glass products with regard to acoustic comfort is the sound attenuation index Rw. The values of this index for each hard coated glass can be seen on AGC Glass Europe's yourglass website:

https://www.agc-yourglass.com/configurator/en?cc=INT-EN_BRANDING&cs=google&cm=cpc&gad_source=1&gclid=EAIaIQobChMIu66Ku5n9ggMVmPrjBx0H-Qr0EAAYASABEgIt7_D_BwE

3. **Product characteristics that contribute to the creation of conditions of visual comfort in the building**

The relevant technical characteristics of the 4 mm thick hard coated glass products regarding hygrothermal comfort are shown in the Table 14.

4. **Product characteristics involved in the creation of conditions of olfactory comfort in the building**

No tests on olfactory comfort have been carried out.

The product covered by this EPD is made of glass, which is a mineral and inert material.

Additional data available at https://agc-yourglass.com/

And in the "Sustainability" section of our website https://www.agc-glass.eu/fr/durabilite

Performance indicators of the various Hard coating products.

Table 14: Performance indicators for the different ranges of hard coated glass 4 mm.

	Float glass	Stopsol Classic	Stopsol SilverLight (priva blue)	Stopsol SuperSilver	Sunergy	Planibel A	Planibel G	Planibel G fasT	Pure comfort 10 (4 mm)	Pure Comfort 14 (4 mm)	Clearsight lite	Clearsight lite comfort	Planibel Antifog	Planibel Easy
Light transmittance (τ_v[%])	90	39	38	63	70	80	83	83	81	83	97	92	83	83
Total solar energy transmittance (g [%])	88	56	41	68	61	72	77	77	72	75	84	77	77	81
External light reflection (ρ_v [%])	8	27	11	34	9	10	10	10	11	11	1	1	11	14
Internal light reflection (ρ_{vi} [%])	8	32	25	35	10	11	11	11	11	12	1	1	12	14
Shading coefficient (SC)	1.01	0.64	0.47	0.78	0.70	0.83	0.89	0.89	0.83	0.86	0.97	0.89	0.89	0.93
Thermal trasmittance (U value [W/m^2k])	5.8	5.8	5.8	5.8	4.1	3.5	3.7	3.7	3.5	3.6	5.8	5.8	3.7	5.7