AGC GLASS EUROPE

ENVIRONMENTAL
AND HEALTH PRODUCT DECLARATION

Low-Carbon Planibel Clearlite 4 mm

Flat glass – excluding installation accessories

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

April 2024

Registration Number: 20240437786
Publication date: April 2024

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 "EPD" 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

  UF: 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, EPDs 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. This EPD and the underlying study were carried out by Gaspard Chantrain, Sustainability and Life Cycle Assessment Engineer at 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 Low-Carbon Planibel 4 mm product, flat glass marketed by AGC Glass Europe in France. At the time of this declaration, 2 AGC Glass Europe sites in Europe manufacture Low-Carbon Planibel range for the European market, including the French market. The results of this EPD reflect the data collected from these sites, representing 100% of European production.

The data reflects years 2022 -2023.

3. System Boundaries

From cradle to grave, with module D.

4. Type of EPD

Individual.

5. Verifier

This EPD has been verified by Cécile Beaudard and Guillaume Audard (Solinnen), auditors 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 April 2024.

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, 2029.

9. Commercial reference of the product

The product covered is the Low-Carbon Planibel Clearlite 4 mm, a 4 mm thick soda-lime flat glass. This product represent actual product marketed by AGC Glass Europe.

10. Scope of validity

This EPD only covers the above-mentioned product, Low-Carbon Planibel with a thickness of 4 mm. Other thicknesses are marketed by AGC Glass Europe for Low-Carbon Planibel products, but these are not covered by this EPD.

AGC Glass Europe also markets standard Planibel ranges. These ranges are not covered by this EPD, but other EPDs are published to cover these ranges.

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: Cécile Beaudard and Guillaume Audard, auditors at Solinnen
ISO 14025 compliant program registration number: 20240437786
Date of 1st publication: April 2024
Verification date: April 2024
Validity period: April 2024 – December 2029

• Description of the business unit and product

1. Description of the functional unit

To provide the function of 1 m² of flat glass used in construction or furnishing for a lifespan of 30 years without mounting accessories.

The reference flow is a 10 kg Low-Carbon Planibel corresponding to 4 mm thick.

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 Low-Carbon Planibel glass, consisting of a 4 mm soda-lime flat glass.
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 Low-Carbon Planibel range also comply with the requirements of the following standards:

- NF EN 572-1 – Glass in construction – Basic products: basic soda-lime silicate glass – Part 1: definition and general physical and mechanical properties;
- NF EN 572-2 – Glass in construction – Basic products: basic soda-lime silicate glass – Part 2: Ice (float glass).

All Low-Carbon Planibel 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)

Low-Carbon Planibel float glass is intended for use on facades in buildings and construction works. It can be used in a variety of other applications in the construction industry. In the vast majority of cases, Low-Carbon Planibel 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 (material consumption, cutting yield, additional transport, etc.).

4. Main performance of the functional unit

The range of Low-Carbon Planibel have different performances depending on the thickness, but the functional unit is always to ensure the function of 1 m² of flat glass used in construction or furnishing for a lifespan of 30 years. Performance indicators are discussed in the next section.

Float glass has no particular characteristics with regard to resistance to fire, 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 the Low-Carbon Planibel 4 mm at the Table 1 below.

Table 1: Performance indicators for the different ranges of Low-Carbon Planibel 4 mm.

	Planibel Low-Carbon
Light transmission (τv [%])	90
Total solar energy transmission (g [%])	88
External light reflection (ρv [%])	8
Internal light reflection (ρvi [%])	8
Shading coefficient (SC)	1.01
Thermal transmittance (valeur U [W/(m². K)])	5.6

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

Despite the differences in terms of production, Planibel Low-Carbon has the same chemical composition and properties as the standard Planibel range. Float glass are all 4 mm thick soda-lime glass.

Table 2: Composition of a 4 mm Low-Carbon Planibel.

Product Composition	Low-Carbon Planibel 4 mm
Soda lime flat glass	
Mass	10 kg

The difference between Planibel Low-Carbon and standard Planibel lies in the production process, which uses a high percentage of cullet, electricity for which guarantees of origin have been purchased for renewable electricity and is produced exclusively in high-efficiency furnaces using the latest technology.

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 Low-Carbon Planibel 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 Low-Carbon flat glass used to produce Low-Carbon Planibel.

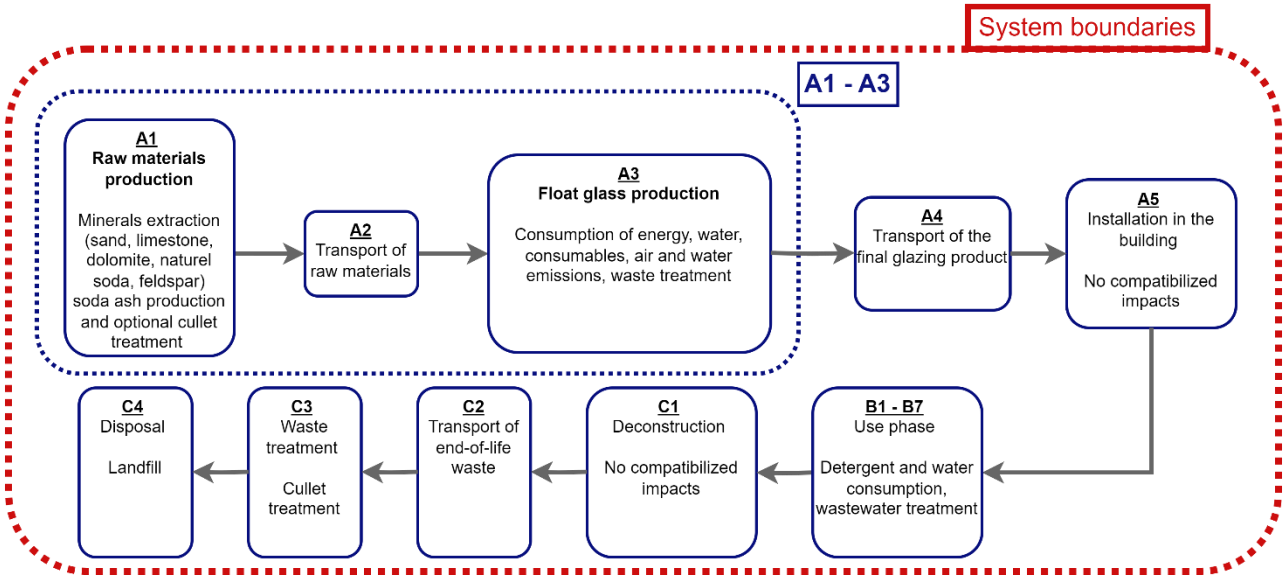

Figure 1: System overview.

	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 float 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 glass manufacturing process consists of the following steps:

- Supply of raw materials and cullet. Cullet[1] can be either furnace process cullet (cullet generated by a flat glass melting process capable of being reintroduced into a flat glass furnace without any treatment other than standard crushing and/or metal separation) or pre-consumer cullet (co-product resulting from industrial operations starting with the stacking of glass after it leaves the glass furnace and ending at the stage where the product reaches finished product status).

- The melting of the raw materials, within the glass furnace. The raw materials are heated to 1600°C in order to melt them down and ensure their chemical reaction (decarbonation).

- The molten glass is then poured over a bath of molten tin, called a "float", which gives the glass its flat shape. The tin bath is used because this metal has a significantly higher density than glass (6.5 and 2.5 respectively).

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

All inputs and outputs have been taken into account as far as possible. No known data were intentionally excluded as part of this assessment.

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.

[1]Furnace process cullet and pre-consumer cullet are not considered as secondary materials in this study.

- ## 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.

1. Parameters for transport to the construction site

The transport considered in this study is the average delivery distance from AGC Glass Europe's Low-Carbon Planibel 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	485	kilometre
Capacity utilization (including no-load returns)	87.5	%
Density of products transported	2500	kg/m³
Volume coefficient of usage	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.

- ## Use stage (excluding potential savings), B1-B7

The only module taken into account 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 of 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	Unity | Description
Proportion of glass sent to landfill	100	%
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 tonnes.

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 end-of-life scenario of the product does not take into account any recycling, therefore 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 Cullet have been considered as a production waste that has been reached the end of waste status in a previous system and then considered as free of charge in terms of LCA.
Allocations	Mass
Geographical representativeness and temporal representativeness of primary data	**Geographic** 2 European production sites of AGC Glass Europe, representing 100% of Low-Carbon Planibel European production for the European market, specifically including the French market. **Time** Primary data collected for years 2022 -2023. **Technological** Primary input-output and transport data for the calculation of the LCI were collected from AGC's production site located in Europe, representing 100% of Low-Carbon Planibel European production.
Geographical representativeness and temporal representativeness of background data	The secondary data is mainly from the 2023.2 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 primarily has a collection date of less than 10 years.
Cut-off Criteria	All known constituents of the product and its packaging have been taken into account, with the exception of reusable metal stillages.
Energy Modelling	The electricity mix corresponds to the electricity mix purchased by AGC Glass Europe via cancelled guarantees of origin to cover the electricity consumed by Low-Carbon Planibel production. The emission factor for this mix has been calculated at 20.8 g CO_2 eq./kWh.

	Natural gas consumption corresponds to the natural gas supply mix of the countries in which AGC Glass Europe produces Low-Carbon Planibel glass.
Variability in results	The variability of the results was studied at the A1-A3 production stage in order to verify that, for all Low-Carbon Planibel production sites, the variability of the results is less than 35% for the control indicators of the NF EN 15804+A2/CN:2022 standard: – Global warming: maximum variability of 4% – Non-renewable primary energy use excluding non-renewable primary energy resources used as feedstocks: maximum variability of 5% – Non-hazardous waste disposed of maximum variability of 1%

- 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*	5.46	3.27E-01	0	0	1.16E-01	0	0	0	0	0	0	3.36E-02	0	1.65E-01	0
Climate Change – Fossil *kg CO_2 eq./FU*	5.43	3.07E-01	0	0	3.32E-02	0	0	0	0	0	0	3.16E-02	0	1.48E-01	0
Climate Change – Biogenic *kg CO_2 eq./FU*	2.10E-02	1.72E-02	0	0	4.02E-02	0	0	0	0	0	0	1.76E-03	0	1.61E-02	0
Climate Change - Land Use and Land Use Change *kg CO_2 eq./FU*	1.56E-03	2.84E-03	0	0	4.26E-02	0	0	0	0	0	0	2.92E-04	0	4.67E-04	0
Ozone depletion *kg of CFC 11 eq./FU*	8.84E-10	2.69E-14	0	0	3.15E-09	0	0	0	0	0	0	2.76E-15	0	3.82E-13	0
Acidification *mole of H+ eq./FU*	3.65E-02	1.03E-03	0	0	4.10E-04	0	0	0	0	0	0	1.06E-04	0	1.07E-03	0
Aquatic eutrophication, freshwater *kg of P eq./FU*	2.95E-05	1.12E-06	0	0	1.62E-05	0	0	0	0	0	0	1.15E-07	0	3.02E-07	0
Aquatic eutrophication, marine *kg N eq./FU*	8.60E-03	4.72E-04	0	0	4.42E-04	0	0	0	0	0	0	4.90E-05	0	2.75E-04	0
Terrestrial eutrophication *mole of N eq./FU*	9.64E-02	5.30E-03	0	0	1.50E-03	0	0	0	0	0	0	5.50E-04	0	3.03E-03	0
Photochemical ozone formation *kg NMCOV eq./FU*	2.34E-02	9.26E-04	0	0	2.14E-04	0	0	0	0	0	0	9.60E-05	0	8.31E-04	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	
Depletion of abiotic resources (minerals and metals)[2] *kg Sb eq./FU*	1.97E-06	1.99E-08	0	0	5.04E-07	0	0	0	0	0	0	2.05E-09	0	6.94E-09	0
Depletion of abiotic resources (fossil fuels)[1] *MJ/FU*	7.80E+01	4.18	0	0	4.00E-01	0	0	0	0	0	0	4.29E-01	0	2.00E+00	0
Water Requirement[1] *m^3 of deprivation eq. in the world /FU*	9.38E-02	3.54E-03	0	0	1.66E-01	0	0	0	0	0	0	3.64E-04	0	1.65E-02	0

Table 10: Resource utilization.

RESOURCE UTILIZATION															
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*	1.88E+01	2.96E-01	0	0	1.80	0	0	0	0	0	0	3.26E-01	0	3.26E-01	0
Use of Renewable Primary Energy Resources as Materials - *MJ/FU*	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[2] 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.

RESOURCE UTILIZATION

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*	1.88E+01	2.96E-01	0	0	1.80	0	0	0	0	0	0	3.26E-01	0	3.26E-01	0
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as feedstock - *MJ/FU*	7.81E+01	4.19	0	0	4.59E-01	0	0	0	0	0	0	2.00	0	2.00	0
Use of non-renewable primary energy resources as raw materials - *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as feedstock) - *MJ/FU*	7.81E+01	4.19	0	0	4.59E-01	0	0	0	0	0	0	2.00	0	2.00	0
Use of secondary material - *kg/FU*	1.87E-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of Renewable Secondary Fuels - *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of Non-Renewable Secondary Fuels - *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Freshwater Use - m^3/*FU*	3.69E-03	3.26E-04	0	0	3.87E-03	0	0	0	0	0	0	3.35E-05	0	5.05E-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*	1.23E-08	1.55E-11	0	0	4.04E-13	0	0	0	0	0	0	1.59E-12	0	4.36E-11	0
Non-hazardous waste disposed - *kg/FU*	2.73E-01	6.03E-04	0	0	5.92E-03	0	0	0	0	0	0	6.20E-05	0	1.00E+01	0
Radioactive waste disposed - *kg/FU*	5.45E-04	5.41E-06	0	0	3.29E-06	0	0	0	0	0	0	5.56E-07	0	2.28E-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	2.63E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery - *kg/FU*	3.68E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electrical power supplied to the outside - *MJ/FU*	5.66E-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*	1.03E-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*	5.46	3.27E-01	1.16E-01	1.98E-01	6.10	0
Climate change – Fossil *kg CO_2 eq./FU*	5.43	3.07E-01	3.32E-02	1.80E-01	5.95	0
Climate change – Biogenic *kg CO_2 eq./FU*	2.10E-02	1.72E-02	4.02E-02	1.78E-02	9.63E-02	0
Climate change - Land cover and land cover change *kg CO_2 eq./FU*	1.56E-03	2.84E-03	4.26E-02	7.59E-04	4.78E-02	0
Ozone depletion *kg of CFC 11 eq. /FU*	8.84E-10	2.69E-14	3.15E-09	3.85E-13	4.03E-09	0
Acidification *mole of H+ eq. /FU*	3.65E-02	1.03E-03	4.10E-04	1.17E-03	3.91E-02	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, freshwater *kg P eq./FU*	2.95E-05	1.12E-06	1.62E-05	4.17E-07	4.72E-05	0
Aquatic eutrophication, marine *kg N eq./FU*	8.60E-03	4.72E-04	4.42E-04	3.24E-04	9.84E-03	0
Terrestrial eutrophication *mole of N eq./FU*	9.64E-02	5.30E-03	1.50E-03	3.58E-03	1.07E-01	0
Photochemical ozone formation *kg NMCOV eq./FU*	2.34E-02	9.26E-04	2.14E-04	9.27E-04	2.55E-02	0
Depletion of abiotic resources (minerals and metals)[1] *kg Sb eq./FU*	1.97E-06	1.99E-08	5.04E-07	8.99E-09	2.50E-06	0
Depletion of abiotic resources (fossil fuels)[1] *MJ/FU*	7.80E+01	4.18	4.00E-01	2.43	8.50E+01	0
Water requirement[1] *m^3 of deprivation eqivalent in the world /FU*	9.38E-02	3.54E-03	1.66E-01	1.69E-02	2.80E-01	0
Resource Utilization						
Use of renewable primary energy, excluding renewable primary energy resources used as feedstock - MJ/FU	1.88E+01	2.96E-01	1.80	6.52E-01	2.16E+01	0
Use of Renewable Primary Energy Resources as Materials - MJ/FU	0.00E+00	0	0	0	0.00E+00	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as feedstock) - *MJ/FU*	1.88E+01	2.96E-01	1.80	6.52E-01	2.16E+01	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, excluding non-renewable primary energy resources used as feedstock - MJ/FU	7.81E+01	4.19	4.59E-01	4.00	8.67E+01	0
Use of non-renewable primary energy resources as raw materials - MJ/FU	0	0	0	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as feedstock) - *MJ/FU*	7.81E+01	4.19	4.59E-01	4.00	8.67E+01	0
Use of secondary material - kg/FU	1.87E-01	0	0	0	1.87E-01	0
Use of Renewable Secondary Fuels - MJ/FU	0	0	0	0	0	0
Use of Non-Renewable Secondary Fuels - MJ/FU	0	0	0	0	0	0
Net Freshwater Use - m^3/FU	3.69E-03	3.26E-04	3.87E-03	5.39E-04	8.42E-03	0
Waste Category						
Hazardous Waste Disposed of - *kg/FU*	1.23E-08	1.55E-11	4.04E-13	4.52E-11	1.24E-08	0
Non-Hazardous Waste Disposed of - *kg/FU*	2.73E-01	6.03E-04	5.92E-03	1.00E+01	1.03E+01	0
Radioactive waste disposed of - *kg/FU*	5.45E-04	5.41E-06	3.29E-06	2.33E-05	5.77E-04	0
Outgoing flows						
Components for reuse - *kg/FU*	0	0	0	0	0	0
Materials for recycling - *kg/FU*	2.63E-02	0	0	0	2.63E-02	0
Materials for energy recovery - *kg/FU*	3.68E-03	0	0	0	3.68E-03	0
Electrical power supplied to the outside - *MJ/FU*	5.66E-03	0	0	0	5.66E-03	0
Steam energy supplied to the outside - *MJ/FU*	1.03E-02	0	0	0	1.03E-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.

Decree No. 2011-321 of 23 March 2011 on the labelling of construction products or wall or floor coverings and paints and varnishes on their emissions of volatile pollutants, and in particular its article Art R221-23 exempts products composed exclusively of untreated glass from carrying out tests and labelling relating to VOC and formaldehyde emissions.

Source: Decree No. 2011-321 of 23 March 2011 on the labelling of construction or wall or floor covering products and paints and varnishes on their emissions of volatile pollutants

- **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 can be seen in the Table 1 .

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

The relevant technical characteristic of 4 mm thick float glass products with regard to acoustic comfort is the sound attenuation index Rw. The values of this index for each Low-Carbon Planibel 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 float glass products regarding hygrothermal comfort can be seen in the Table 1.

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

No tests on olfactory comfort have been carried out.

In addition, the product is made of glass, a mineral and inert material. It is not likely to emit odours during use.

Additional Information

1. AGC's Environmental Policy and Objectives

AGC Glass Europe has set itself ambitious environmental targets to reflect AGC's main desire in terms of sustainability: to maximise the societal added value provided by our products while minimising environmental impacts. The main objectives are to reduce greenhouse gas emissions by -30% by 2030[3] and achieve carbon neutrality by 2050. In order to achieve these goals, AGC Glass Europe has opted for a holistic approach by working on 5 main aspects:

- Sourcing of sustainable raw materials
- Use of energy-efficient ovens
- Increasing the use of recycled glass
- Use of electricity with a low impact on climate change
- Optimization of the transport of raw materials and finished products

More information is available on our website: https://www.agc-glass.eu/en/sustainability

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

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

[3] Target of -30% for greenhouse gas emissions for scopes 1+2 compared to 2019 emissions and -30% for scope 3 emissions over the same period.