Environmental Product Declaration

For AIS Laminated Glass

from Asahi India Glass Ltd.
In accordance with ISO 14025: 2006 & EN 15804:2012 +A2:2019/AC: 2021

PROGRAMME OPERATOR	EPD International AB
GEOGRAPHICAL SCOPE	Global
EPD REGISTRATION NUMBER	EPD-IES-0024584
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VALID UNTIL	2030-06-17

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AIS
Asahi India Glass Ltd.

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Program Information

The International Organization for Standardization (ISO) 14025 defines an Environmental Product Declaration (EPD) as a Type III declaration that quantifies environmental information about a product's life cycle. Based on ISO series 14040, the Life Cycle Assessment (LCA) forms the basis of the EPD approach. EPDs are primarily meant to assist business-to-business interactions, but they may also be useful to environmentally conscious consumers when purchasing goods or services.

• **Programme:**	**The International EPD® System**
• **Declaration Holder:**	**Asahi India Glass Ltd. (AIS)**
• Declaration Number:	**EPD-IES-0024584**
• **Declared Products:**	**AIS Laminated Glass**
• **Address:**	EPD International AB, Box 21060, SE-100 31 Stockholm, Sweden
• **Website:**	www.envirodec.com; www.envirodecindia.com
• **Email:**	Info@envirodec.com
• **Product Category Rules (PCR):**	PCR 2019 :14 Construction products (EN 15804 :2012: A2) version 1.3.4 and its c-PCR-009 Flat glass products used in buildings and other construction works (EN17074:2019)
• **Verification and reference PCR:**	CEN standard EN 15804 serves as the core Product Category Rules (PCR)
• **The PCR review was conducted by:**	The Technical Committee of the International EPD System. See www.envirodec.com for list of members. Review chair: Claudia A. Pen a, University of Concepcio n, Chile. The review panel may be contacted via the Secretariate www.environdec.com/contact.
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	
☐ **EPD process verification**	✓ **EPD verification**
• **This declaration was independently verified in accordance with ISO 14025:2006 by:**	Sunil Kumar SIPL Pvt Ltd sunil@sipl-sustainability.com
• **This life cycle assessment and EPD design was conducted by:**	Suraj Shekhar, Sustainability Consultant, The ESG Advisory suraj.shekhar@theesgadvisory.in
• **Address and Contact of the EPD Owner:**	Asahi India Glass Ltd. Taloja MIDC, Plot- T7, MIDC Road, Mumbai, Raigad, Maharashtra, 410208 Contact person: Mr. Nagendra Kumar Email Adress - nagendra.kumar@aisglass.com

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

EPDs within the same product category but registered in different EPD programs, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company Information

Asahi India Glass Ltd. (AIS) is India's leading integrated glass and window solutions company and a dominant player both in the automotive and the building & construction segments. Our product solutions, spanning the entire breadth of automotive, building & construction, and consumer glass, are designed to deliver aesthetics and functional benefits. Starting operations in 1987, AIS is an outcome of a Joint Venture between the Labroo family, Asahi Glass Co. Limited Japan (now AGC Inc.), and Maruti Udyog Limited (now Maruti Suzuki India Limited., MSIL)

AIS' presence extends across India with around **15 plants** and **4 sub-assemblies** and 6 offices. Our worldwide presence is across nations like Sri Lanka, Africa and many parts Middle East Asia. To focus better on specific market segments and to serve customers better, AIS has organized its business into 3 Strategic Business Units (SBUs):

- **Automotive**
- **Building & Construction**
- **Consumer Glass**

It is engaged in production and delivery of next generation glass products and solutions to retail and institutional customers though these SBUs and provides end-to-end solutions across the entire value chain - from manufacturing of float glass to glass processing, fabrication and installation.

AIS has been honored with awards and recognition as acknowledgement of its contributions to the glass industry. Corporate governance is an intrinsic part of the Company. AIS is committed to achieving the highest standards of accountability, transparency, and equity in all its spheres and dealings with its stakeholders. AIS is an **ISO 9001** and **ISO 14001** company listed on the National Stock Exchange Limited and Bombay Stock Exchange Limited.

With the development of innovative construction techniques and glass-processing methods, AIS products are manufactured to deliver superior performance and added value. Our manufacturing units are equipped with state-of-the-art machinery that delivers a full range of high-quality processed and value-added glass products meeting international standards.

At AIS, we do not compromise on the quality of the product that we deliver. Our products are put through stringent inspections in our well-equipped laboratory and testing facilities to ensure the highest quality. After inspection, they are stored in a clean environment. All our products adhere to ISO 9001:2015, IS 2553 Part-1 for tempered & laminated glasses & IS 2553 Part 2 for Tempering.

Company Information

Product Information

AIS Laminated glass

AIS manufactures Laminated Glass both at their Architectural and Automotive plants located at multiple locations- Taloja, Roorkee, Bangalore, Bawal, Patan and Chennai.

Laminated safety glass is designed for enhanced strength and impact resistance. It is manufactured by adhering two or more layers of glass together with a flexible PVB interlayer. This takes place through a heat and pressure process in which the chemical bond formed between the glass and PVB interlayer does not merely join them but 'conjoins' them to create an entirely new material, which holds the glass together upon impact. This structure reduces the risk of breakage and provides high intrusion resistance, making it a durable and secure glazing option for buildings and other applications. The major properties include safety and security, acoustic and UV cut.

- Provides Level 2 and Level 3 protection from burglar attacks
- Eliminates the need for grills or shutters, without compromising on safety
- Finds application in windows, roof lights, canopies, domes, skylights, glass lifts, etc.
- In the unlikely event of breakage, the PVB interlayer acts as an extra layer of protection
- Effectively reduces sound for better acoustic performance

Intended Use

Laminated glass with a PVB interlayer is used for safety and security. The PVB layer holds the glass together if it breaks, preventing sharp pieces from scattering. It is commonly used in windows, doors, balconies, skylights, and car windshields. It also helps reduce noise and blocks harmful UV rays.

UN CPC Code- 37115

Figure: Laminated safety glass manufactured by AIS Glass

Content Declaration

Table: Content Declaration of Laminated glass

Product Components	Weight, kg
Base glass	25
PVB	0.5

Packaging Components	Weight, kg
Wood	0.05

Till this 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).

Life Cycle Assessment

Geographical scope:	**Global**
Declared unit:	One square metre (1 m^2)
Declared Product:	Laminated glass
UN CPC Code	37115
Reference service life:	A reference service life of 30 years is used for this EPD, as prescribed in EN 17074:2019.
Time representativeness:	Primary data from the manufacturing site, suppliers, and the electricity mix were collected for the period starting from FY 2023 -FY 2024
Database(s) and LCA software used:	Ecoinvent v3.10 (allocation, cut-off by classification) database and SimaPro v9.6 software have been used for the LCA calculations. LCA methods used are EN 15804: A2; EF3.1 compliant.
Description of system boundaries	Cradle to grave with Module D (A+B+C+D)
Data quality and data collection:	According to EN 15804:2012+A2:2019/AC:2021 specific data was used for module A3 (Processes the manufacturer has influence over) and was gathered from the Asahi India Glass Limited Manufacturing unit. Specific data includes actual product weights, amounts of raw materials used, product content, energy consumption, transport figures, water consumption, and amounts of waste.
Allocation:	In this study, allocation has not been applied.
Cut-off rules:	Life Cycle Inventory data for a minimum of 99 % of total inflows to the life cycle stages have been included and a cut-off rule of 1% regarding energy, mass and environmental relevance was applied. Impacts caused by treatment operations have been calculated lower than 1% environmental relevance.

According to EN 15804+A2, 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

Modules Declared, Geographical Scope, Share of Specific Data and Data Variation

Table: Modules Declared, Geographical Scope, Share of Specific Data and Data Variation

X: Declared ND: Not declared.	Product stage			Construction process stage		Use stage							End-of-life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Recycling potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	IN	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	>85			-	-	-	-	-	-	-	-	-	-				-
Variation – products	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Declaration of Sources and Share of Primary Data

Table: Declaration of Sources and Share of Primary Data

Process	Source type	Source	Reference Year	Data category	%Share of primary data of GWP-GHG results for A1-A3
Base Glass	EPD	EPD-IES-0024574	2024	Primary Data	62.1
PVB	Database	Ecoinvent 3.10	2024	Secondary Data	2.8
Electricity	Collected+Database	SIPL+Ecoinvent 3.10	2024	Primary Data	19.6
Transportation	Collected+Database	SIPL+Ecoinvent 3.10	2024	Primary Data	8.2

Note: The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that do not capture all relevant aspects of data quality. The indicator is not comparable across product categories.

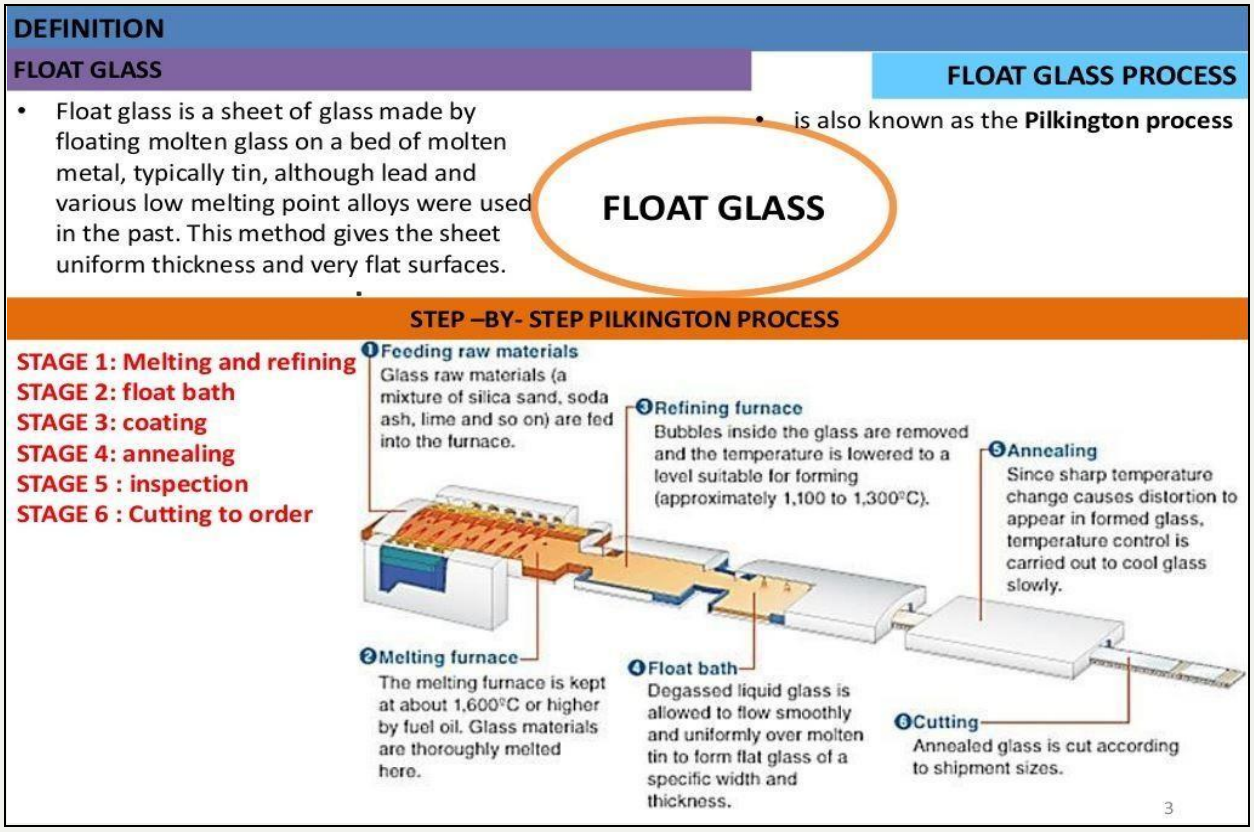
Manufacturing Flow Chart

The main steps in float glass manufacturing process are:

3.2.1 Batch Mixer
Mix of raw materials (silica, soda ash, lime, feldspar and dolomite) to which is added recycled glass (cullet) and other compounds.

3.2.2 Float Glass Production
Raw materials are melted at 1550 ℃ in a furnace by fuel oil. Bubbles inside the glass are removed and the temperature is lowered to a level suitable for forming (1100 to 1300 ℃). 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 3 to 12 millimeters).

3.2.3 Annealing
Since the sharp temperature change causes distortion to appear in formed glass, temperature control is carried out to cool glass slowly. The glass is lifted onto conveyor rollers and passes through a controlled cooling tunnel measuring more than 150 meters in length.



3.2.4 Coating (if required)

The float glass can be coated (soft coat or hard coat) as per the requirement and then can undergo the processing required.

3.2.5 Processing

The float glass can further undergo a variety of processing operations to improve the performance and characteristics of the glass. The resultant glass is Heat Tempered Glass, Laminated glass, IGU or Glazed Glass and Printed Glass.

3.2.6 Lamination Interlayer Placement

A polyvinyl butyral (PVB) interlayer is placed between the glass sheets. This interlayer acts as an adhesive, holding the glass layers together even when broken, thereby enhancing safety.

Pre-Pressing: The glass and interlayer assembly is subjected to heat and pressure to remove air pockets and ensure proper adhesion.

Autoclaving: The pre-pressed assembly is then placed in an autoclave—a high-pressure oven—where it is heated to around 130°C under pressure. This process ensures a strong bond between the glass layers and the interlayer, resulting in a durable laminated glass panel.

3.2.7 Packing

The sheets of laminated glasses are raised by vacuum cups that then place them for packing.

3.2.8 Storage and Dispatch

The glass is then stored in warehouses, and which are then dispatched to the corresponding locations.

Life Cycle stages

A1-A3, Cradle to Gate – Mandatory Module

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

A1, Raw materials supply:
This includes the extraction and processing of all raw materials and energy which occur upstream from the manufacturing process.
A2, Transport to the manufacturer:
The raw materials are transported to the manufacturing site. The modelling includes road, ship and/or train transportation of each raw material.
A3, Manufacturing:
This module includes the manufacture of products and the manufacture of packaging. The production of packaging material is considered at this stage. The processing of any waste arising from this stage is also included.

A4-A5, Construction process stage

The construction process is divided into 2 modules: A4, transport to the building site and A5, installation in the building.

A4, Transport to the building site:

This module includes transport from the production gate to the building site.

PARAMETER	VALUE /DESCRIPTION
Vehicle	Vehicle type: Lorry_11 metric ton India specific Transportation
Distance to construction site	1000 km
Bulk density of transported products*	2500 kg/m3

A5, Installation in the building:

The accompanying table quantifies the parameters for installing the product at the building site. All installation materials and their waste processing are included.

PARAMETER	VALUE/DESCRIPTION
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	According to PCR EN 17074, no waste is considered
Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route)	30% Packaging Wood recycled 70% (Packaging Wood Incinerated without energy recovery)

B1 -B7 De-construction

The use stage is divided into the following modules:

- **B1: Use**
- **B2: Maintenance**
- **B3: Repair**
- **B4: Replacement**
- **B5: Refurbishment**
- **B6: Operational energy use**
- **B7: Operational water use**

The product has a reference service life of 30 years. This assumes that the product will last in situ with no requirements for repair, replacement or refurbishment throughout this period. Therefore, it has no impact at this stage, except for maintenance.

B2, Maintenance:

According to PCR EN 17074, only the maintenance by cleaning glass with water and cleaning agent is included in this study.

PARAMETER	VALUE /DESCRIPTION
Maintenance process	**Water and cleaning agent**
Maintenance cycle	**Annual average**
Ancillary materials for maintenance (e.g. cleaning agent, specify materials)	**cleaning agent: 0.001 kg/m² of glass/year**
Wastage material during maintenance (specify materials)	**0 kg**
Net freshwater consumption during maintenance	**0.2 kg/m² of glass/year**
Energy input during maintenance	**None required during product lifetime**

C1-C4, End of Life Stage

C1 - De-construction

The de-construction and/or dismantling of the product take part of the demolition of the entire building. Energy consumption for demolition is considered 0.01 kWh/m².

C2 - Transport to waste processing

It is estimated that there is no mass loss during the use of the product therefore the end-of-life product is assumed to have the same weight as the declared product whole. End of life products are assumed to be sent to the closest facilities such as landfill. Transportation distance to the closest disposal area is estimated 50 km.

C3 - Waste processing for reuse, recovery and/or recycling

It is assumed that 100% of products are collected at demolition site and send directly to landfill facilities.

C4 - Final Disposal

100% of glass is landfilled. Landfill site is at the distance of 50km.

Biogenic balancing for packaging has been done in A5.

Table: Parameters C1-14 module

PARAMETER	VALUE/DESCRIPTION
Thickness (mm)	5mm thick glass + 1.52mm Interlayer + 5mm thick glass
Collection process specified by type	25 kg collected per 1 m2 0 kg collected with no separation between construction product
Recovery system specified by type	0 kg reuse 0 kg recycled 0 kg for energy recovery
Disposal specified by type	25 kg disposed of in landfill per 1 m2
Assumptions for scenario development (e.g. transportation)	50 km to landfill site and 0 km for recycling site
Transport by Truck	Lorry_11 metric ton

D - Reuse, recovery or recycling

No benefits are accounted for in the assessment.

Electricity Modelling

71% of electricity is taken from Electricity Grid of India and 29% from the solar. Climate impact as kg CO2 eq./kWh using the GWP-GHG indicator for Electricity Grid of India is **0.963 kg CO2 eq./ kWh** and for Solar panel is **0.064 Kg CO2 eq./kWh.** Percentage of solar was determined using a weighted average of the total production from all the plants.

Environmental Performance

Results for 1m2 of Laminated Glass

Table: Potential environmental impact – mandatory indicators according to EN 15804:2012+A2:2019/AC:2021 `

Results for 1m2 Laminated Glass																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO2 eq	4.59E+01	1.97E-01	1.48E+00	0.00	1.80E-01	0.00	0.00	0.00	0.00	0.00	1.20E-01	9.84E-02	0.00	6.85E-02	0.00
GWP-biogenic	kg CO2 eq	-1.48E+00	0.00	1.48E+00	0.00	3.01E-02	0.00	0.00	0.00	0.00	0.00	7.11E-05	2.91E-05	0.00	9.88E-05	0.00
GWP-fossil	kg CO2 eq	4.74E+01	1.97E-01	0.00	0.00	7.84E-02	0.00	0.00	0.00	0.00	0.00	1.20E-01	9.84E-02	0.00	6.83E-02	0.00
GWP- luluc	kg CO2 eq	1.10E-02	2.67E-06	0.00	0.00	7.18E-02	0.00	0.00	0.00	0.00	0.00	2.26E-06	1.34E-06	0.00	1.72E-05	0.00
ODP	kg CFC11 eq	2.02E-06	3.38E-08	0.00	0.00	4.39E-09	0.00	0.00	0.00	0.00	0.00	6.48E-10	1.69E-08	0.00	3.86E-09	0.00
AP	mol H+ eq	3.42E-01	1.69E-03	0.00	0.00	4.98E-04	0.00	0.00	0.00	0.00	0.00	7.73E-04	8.47E-04	0.00	3.08E-04	0.00
EP-freshwater	kg P eq	3.49E-03	1.12E-06	0.00	0.00	3.23E-05	0.00	0.00	0.00	0.00	0.00	7.38E-07	5.62E-07	0.00	4.92E-06	0.00
EP- marine	kg N eq	8.16E-02	8.45E-04	0.00	0.00	5.33E-04	0.00	0.00	0.00	0.00	0.00	9.79E-05	4.22E-04	0.00	1.09E-04	0.00
EP-terrestrial	mol N eq	7.46E-01	9.24E-03	0.00	0.00	1.38E-03	0.00	0.00	0.00	0.00	0.00	1.07E-03	4.62E-03	0.00	1.19E-03	0.00
POCP	kg NMVOC eq	1.97E-01	2.20E-03	0.00	0.00	3.21E-04	0.00	0.00	0.00	0.00	0.00	3.10E-04	1.10E-03	0.00	6.77E-04	0.00
ADPE	kg Sb eq	1.30E-04	5.79E-09	0.00	0.00	2.55E-06	0.00	0.00	0.00	0.00	0.00	6.12E-08	2.89E-09	0.00	1.43E-07	0.00
ADPF	MJ	4.47E+02	1.66E+00	0.00	0.00	1.38E+00	0.00	0.00	0.00	0.00	0.00	1.60E+00	8.32E-01	0.00	1.03E-01	0.00
WDP	m3 W eq. Dep	3.84E+03	3.07E-03	0.00	0.00	3.27E-01	0.00	0.00	0.00	0.00	0.00	4.17E+01	1.54E-03	0.00	1.07E-02	0.00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine= Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals & metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

Table: Potential Environmental impact-additional mandatory

Results for 1m2 Laminated Glass																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP - GHG	kg CO2 eq.	4.54E+01	1.96E-01	0.00	0.00	7.84E-02	0.00	0.00	0.00	0.00	0.00	1.20E-01	9.82E-02	0.00	6.76E-02	0.00
Acronyms	GWP-GHG = Global Warming Potential															

*The use of results of modules A1-A3 (A1-A5 for services) without considering the results of module C is discouraged.

*The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks

Table: Potential environmental impact – additional voluntary indicators

Results for 1m2 Laminated Glass																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM/RI	[disease inc.]	1.94E-06	3.83E-09	0.00	0.00	5.95E-09	0.00	0.00	0.00	0.00	0.00	4.07E-09	1.91E-09	0.00	5.40E-09	0.00
IRP	[kBq U235 eq]	9.53E-01	1.17E-02	0.00	0.00	5.53E-03	0.00	0.00	0.00	0.00	0.00	2.62E-04	5.84E-03	0.00	2.89E-03	0.00
ET-freshwater	[CTUe]	4.10E+02	6.76E-01	0.00	0.00	1.68E+00	0.00	0.00	0.00	0.00	0.00	4.37E-01	3.38E-01	0.00	2.62E-01	0.00
HT-cancer	[CTUh]	1.75E-07	2.02E-12	0.00	0.00	1.83E-10	0.00	0.00	0.00	0.00	0.00	1.84E-09	1.01E-12	0.00	1.04E-11	0.00
HT-non-cancer	[CTUh]	1.79E-05	1.06E-10	0.00	0.00	1.47E-09	0.00	0.00	0.00	0.00	0.00	1.91E-07	5.29E-11	0.00	3.76E-10	0.00
SQP	[pt]	2.30E+02	2.12E-02	0.00	0.00	4.01E+00	0.00	0.00	0.00	0.00	0.00	2.53E-02	1.06E-02	0.00	6.28E+00	0.00
Acronyms	PM = Particulate matter emissions; IRP = Ionizing radiation, human health; ET-freshwater = Eco-toxicity (freshwater); HT-cancer = Human toxicity, cancer effects; HT-non-cancer = Human toxicity, non-cancer effects; SQP = Potential soil quality index (SQP)															

Table: Use of resources

Results for 1m2 Laminated Glass																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	5.97E+01	5.37E-03	0.00	0.00	7.69E-01	0.00	0.00	0.00	0.00	0.00	2.47E-03	2.69E-03	0.00	4.64E-02	0.00
PERM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	5.97E+01	5.37E-03	0.00	0.00	7.69E-01	0.00	0.00	0.00	0.00	0.00	2.47E-03	2.69E-03	0.00	4.64E-02	0.00
PENRM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRE	MJ	4.92E+02	1.76E+00	0.00	0.00	1.38E+00	0.00	0.00	0.00	0.00	0.00	1.68E+00	8.82E-01	0.00	1.06E-01	0.00
PENRT	MJ	4.92E+02	1.76E+00	0.00	0.00	1.38E+00	0.00	0.00	0.00	0.00	0.00	1.68E+00	8.82E-01	0.00	1.06E-01	0.00
SM	Kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	1.30E+02	1.05E-04	0.00	0.00	7.61E-03	0.00	0.00	0.00	0.00	0.00	1.42E+00	5.24E-05	0.00	4.08E-03	0.00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

*The use of results of modules A1-A3 (A1-A5 for services) without considering the results of module C is discouraged.
*The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks

Table: Waste production

Results for 1m2 Laminated Glass																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	Kg	1.36E-01	0.00	0.00	0.00	7.69E-11	0.00	0.00	0.00	0.00	0.00	6.97E-05	1.89E-03	0.00	1.58E-05	0.00
NHWD	Kg	2.38E+00	0.00	3.50E-02	0.00	6.47E-03	0.00	0.00	0.00	0.00	0.00	6.62E-04	7.48E-05	0.00	2.50E+01	0.00
RWD	Kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acronyms	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed;															

Table: Output flows

Results for 1m2 Laminated Glass																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	Kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	Kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	Kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acronyms	MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy															

*The use of results of modules A1-A3 (A1-A5 for services) without considering the results of module C is discouraged.

*The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks

Life Cycle Interpretation:

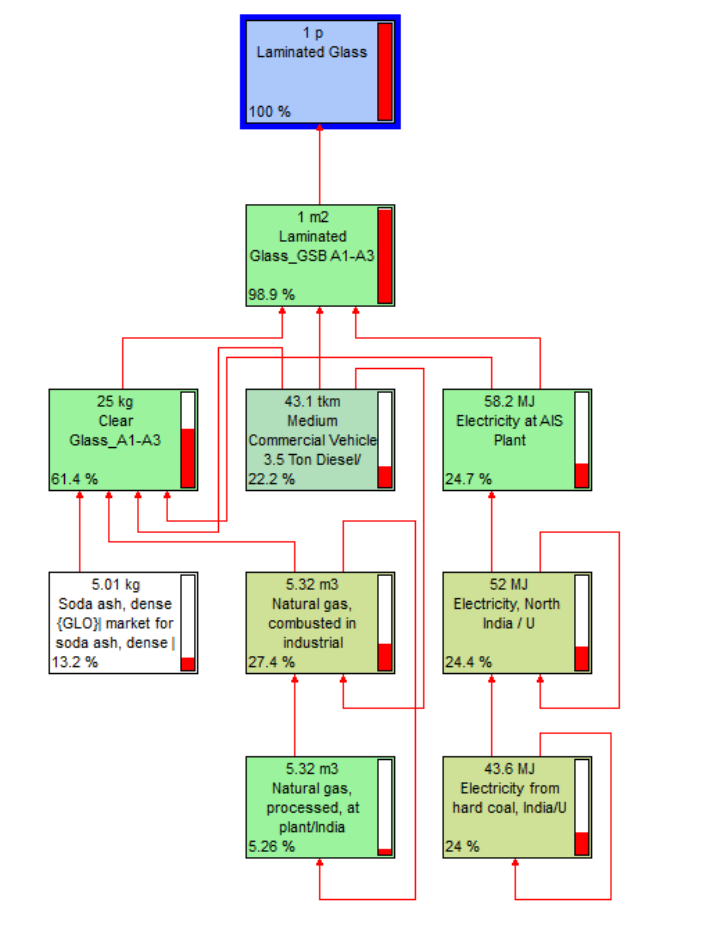


Figure: - Network diagram for GWP-GHG results as kg CO2 eq. for 1m2 of Laminated Glass

Environmental Impact of 1m2 Laminated Glass was calculated as per EN 15804+A2. The system boundary for Life cycle assessment was considered from Cradle to grave with Module D as per product category rules (PCR) for construction products. Clear glass GWP-GHG percentages shown above include contributions from electricity and transportation. That is the reason total is coming out to be more than 100%.

Module A1-A3, which covers raw material extraction, transport, and manufacturing, appeared as the highest impact contributor. Approximately 99% of the total environmental impact comes from the A1-A3 module.

References

- ISO 14040: 2006 Environmental management -- Life cycle assessment -- Principles and framework
- ISO 14044: 2006 Environmental management -- Life cycle assessment -- Requirements and guidelines
- ISO 14025: 2006 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations - Core rules for the product category of construction products
- The International EPD® System / www.environdec.com
- The International EPD® System / The General Programme Instructions v5.0
- The International EPD® System / PCR 2019:14 Construction products v1.2.5 (EN 15804:A2) /
- https://api.environdec.com/api/v1/EPDLibrary/Files/04600e1f-ab96-4e05-9040-08dabb52e166/Data
- Product Environmental Footprint Category Rules Guidance / https://ec.europa.eu/environment/eussd/smgp/pdf/PEFCR_guidance_v6.3.pdf
- Ecoinvent 3.10 / http://www.ecoinvent.org/
- SimaPro LCA Software / https://simapro.com/
- AIS Glass - Best Glass Solution Company in India - Glass Manufacturers, Suppliers & Dealers

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South Asia

CERTIFICATE

The Certification Body
of TÜV SÜD South Asia Private Limited

certifies that

Asahi India Glass Ltd.

Plot no T7, MIDC Industrial Area, Taloja,
District Raigad – 410208, Maharashtra, India

has implemented
Environmental and Occupational Health and Safety Management System

in accordance with **ISO 14001:2015 & ISO 45001:2018**

for the scope of

MANUFACTURING AND SUPPLY OF FLOAT GLASS (CLEAR AND TINTED), REFLECTIVE GLASS, TRENDZ GLASS, LACQUERED GLASS AND KRYSTAL GLASS. DESIGN, MANUFACTURE AND SUPPLY OF SOFT COAT GLASS.

The certificate is valid in conjunction
with the main certificate from **2023-03-29** until **2026-01-15**
Subject to successful completion of annual periodic audits

The present status of this certificate can be obtained through TUV SUD website by scanning below QR code and by entering the certificate number (without spaces) on web page. Further clarifications regarding the status & scope of this certificate may be obtained by consulting the certification body at info.in@tuvsud.com

Certificate Registration No.
EMS - 99 014 00806/02
OHSMS - 99 117 00463/02

Date of Initial certification: **2019-04-30**

Issue Date: **2023-03-29** Rev. **00**

Rahul Kale
Head of Certification Body
of TÜV SÜD South Asia Private Limited,
Mumbai
Member of TÜV SÜD Group

EM009
OH003

Asahi India Glass Ltd.

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

South Asia

CERTIFICATE

The Certification Body
of TÜV SÜD South Asia Private Limited

certifies that

Asahi India Glass Limited

Plot No. T-7, MIDC Industrial Area, Taloja
Panvel, District – Raigad - 410208, Maharashtra, India

has implemented Quality Management System

in accordance with **ISO 9001:2015**

for the scope of

Manufacturing and Supply of Float Glass (Clear & Tinted), Reflective Glass, Frosted & Backpainted Glass. Design, Manufacturing and Supply of Soft Coat Glass

The certificate is valid from **2023-04-25** until **2026-04-24**

Subject to successful completion of annual periodic audits

The present status of this certificate can be obtained through TUV SUD website by scanning below QR code and by entering the certificate number (without spaces) on web page. Further clarifications regarding the status & scope of this certificate may be obtained by consulting the certification body at info.in@tuvsud.com

Certificate Registration No. **99 100 17590**

Date of Initial certification: **2017-04-25**

Issue Date: **2023-02-19** Rev. **00**

Rahul Kale
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NABCB QM011

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD South Asia

CERTIFICATE

The Certification Body
of TÜV SÜD South Asia Private Limited

certifies that

Asahi India Glass Ltd.

Plot no T7, MIDC Industrial Area, Taloja,
District Raigad - 410 208, Maharashtra, India

has implemented Energy Management System

in accordance with **ISO 50001:2018**

for the scope of

MANUFACTURING & SUPPLY OF FLOAT GLASS (CLEAR & TINTED), REFLECTIVE GLASS, TRENDZ GLASS, KRYSTAL GLASS. DESIGN, MANUFACTURING AND SUPPLY OF SOFT COAT GLASS.

The certificate is valid in conjunction
with the main certificate from **2024-02-26** until **2026-12-19**

Subject to successful completion of annual periodic audits

The present status of this certificate can be obtained through TUV SUD website by scanning below QR code and by entering the certificate number (without spaces) on web page. Further clarifications regarding the status & scope of this certificate may be obtained by consulting the certification body at info.in@tuvsud.com

Certificate Registration No. **99 118 00048/02**

Date of Initial certification: **2019-01-25**

Issue Date: **2024-02-26** Rev. **00**

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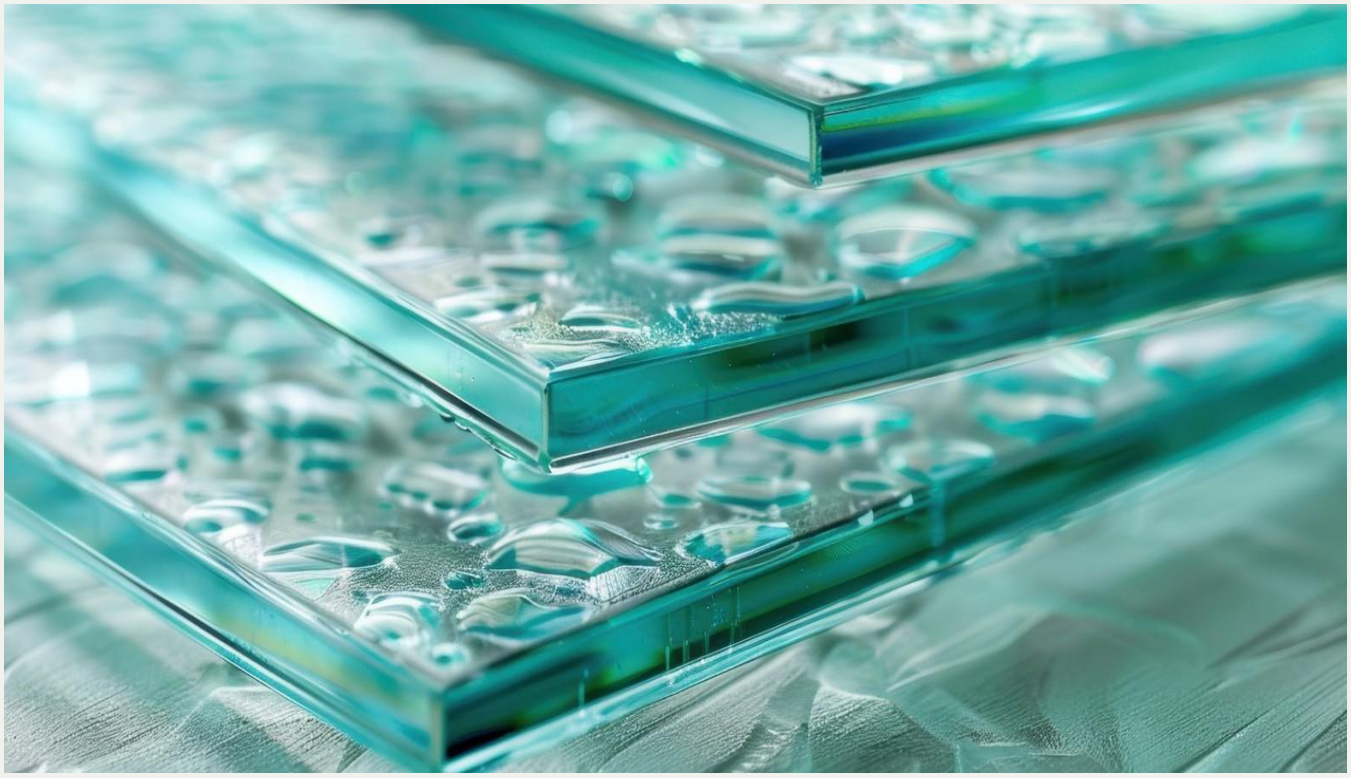
Member of TÜV SÜD Group

NABCB EN005



Third Party Verifier

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sunil@sipl-sustainability.com

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