ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Magnetron Coated Glass
AGC Inc.

EPD HUB, HUB-5082
Published on 23.01.2026, last updated on 23.01.2026, valid until 22.01.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

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AGC
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GENERAL INFORMATION

MANUFACTURER

Manufacturer	AGC Inc.
Address	Global One Ueno, 4-24-11 Higashiueno Taito-ku, Tokyo 110-0015 Japan
Contact details	aap.glass@agc.com
Website	https://agc-glassasia.com/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with modules A4, B2, C1-C4, D
EPD author	AGC Inc.
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	D.V, as authorized verifier acting for EPD HUB Limited

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer 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 and if they are not compared in a building context.

PRODUCT

Product name	Magnetron Coated Glass
Additional labels	Low-E, Solar Control Reflective, Solar control Low-E (all colors, all visible light transmittance, thickness from 3mm to 12mm)
Product reference	-
Place(s) of raw material origin	Indonesia, Thailand, America
Place of production	PT Asahimas Flat Glass Tbk : Cikampek AGC Flat Glass (Thailand) Plc. : Samut Prakan
Place(s) of installation and use	Indonesia, Thailand, other Asian and Oceanian countries, etc
Period for data	2024/01~2024/12
Averaging in EPD	Multiple factories
Variation in GWP-fossil for A1-A3 (%)	7.83
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	33.8

ENVIRONMENTAL DATA SUMMARY

Functional unit	1 m2 of 4 mm thick float glass for RSL of 30 years
Functional unit mass	10 kg
Mass of packaging	0.0269 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	16.6
GWP-total, A1-A3 ($kgCO_2e$)	16.6
Secondary material, inputs (%)	41.8
Secondary material, outputs (%)	0.21
Total energy use, A1-A3 (kWh)	50.4
Net freshwater use, A1-A3 (m^3)	0.08

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

AGC Glass Asia Pacific represents the Architectural Glass Asia Pacific division of the global AGC Group, one of the world's leading supplier and manufacturer of flat Glass. As part of this multinational group, AGC Glass Asia delivers a broad range of Glass solutions for the built environment through various applications of Architectural Glazing, Interior, Industrial, Renewable Energy Glass, and Automotive Glass for the Asia Pacific region. Our mission is to deliver high-value-added products and services through our dedicated teams of experts to bring global solutions and services closer to Asia.

To promote sustainable practices in the green built environment, AGC is committed in ensuring our Glass products are safe and responsibly made, combining functionality and sustainability. We adopt a holistic approach to support the sustainability efforts of Asia Pacific's building industry through our Glass solutions – Energy Saving Glass, Energy-Generating Glass, Environmentally Friendly Glass – which proudly hold internationally recognized sustainability accolades. Our products contribute to leading green building rating systems such as LEED, BCA Green Mark, Green Star etc., supporting building owners, architects and consultants in the design and construction of sustainable buildings.

As the demand for sustainable materials continues to grow, and AGC remains at the forefront by developing Glass solutions that are aligned with the core approach of the AGC Group's sustainability management framework, which is built around three core social values: "Blue Planet, "Innovation and "Well-Being.

PRODUCT DESCRIPTION

AGC's Magnetron Coated Glass range forms a key part of our Energy-saving Glass solutions for Facade applications. Utilizing advanced magnetron sputtering technology, a state-of-the-art vacuum-coating technology that enhances key Glass performance properties. This results in high-performance solar control Glass that improves thermal comfort by reducing heat transmission, while maintaining natural daylight and visual transparency. There are 8 variations of Glass thickness (3, 3.2, 4, 5, 6, 8, 10, 12mm), supplied as Float Glass from same plant.

The range encompasses a broad selection of products, from reflective to silver-based coatings, to address diverse design and performance needs. These products deliver improved energy efficiency and visual refinement, providing architects and developers with flexibility to meet project-specific Facade, curtain wall, and building envelope requirements.

AGC's Magnetron Coated Glass range is supported by sustainable recognition, including Environmental Product Declarations (EPD), and Singapore Green Building Product (SGBP*) certification. These accolades enable the products to contribute to leading green building rating systems such as LEED, BCA Green Mark, Green Star etc., supporting building owners, architects and consultants in the design and construction of sustainable buildings.

Further information can be found at
https://agc-Glassasia.com/our-products
*For selected products only.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	-	-
Minerals	100	Indonesia, Thailand, America
Fossil materials	-	-
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product’s biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.0076

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	-
Mass per Functional unit	10 kg
Functional unit	1 m2 of 4 mm thick float glass
Reference service life	30

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

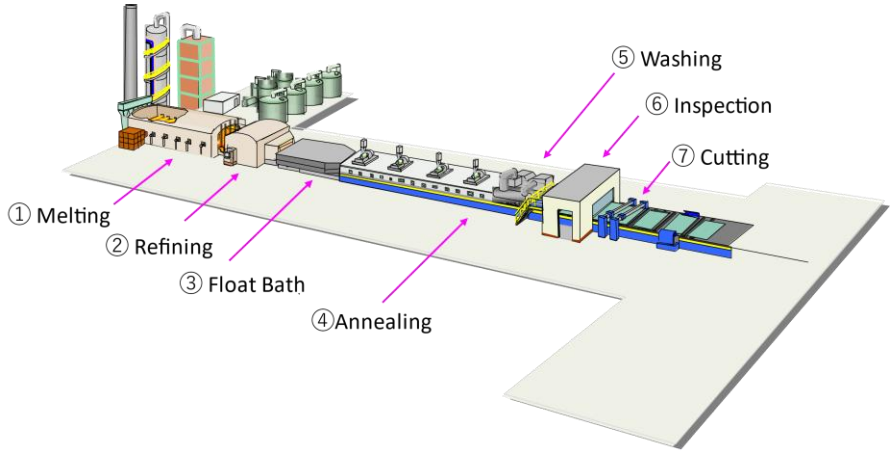
Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
×	×	×	×	ND	ND	×	ND	ND	ND	ND	ND	×	×	×	×	×		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = ND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

This stage is manufacturing stage of Magnetron coated Glass, which consists of Float Glass production and Sputtering process.

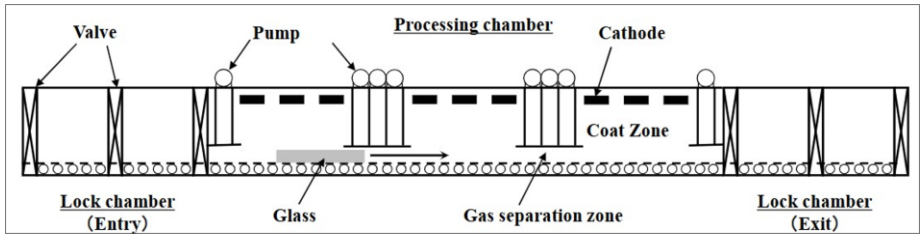
<Float Glass production>
Raw materials are minerals such as silica sand, dolomite, soda ash, and feldspar, from domestic and import sources. After blending these powder materials at a specified ratio, they are melted in a high-temperature Glass furnace. Natural gas combustion energy is used for melting. The molten Glass becomes flat in the process of being poured and floated over molten tin. This is why it is called Float method. The flat ribbon-formed Glass is moved on a conveyor while slowly cooling, and inspected and cut at the end. During the production stage, fuel combustion, electricity, and water are used for each facility. Also, cullets (scraps of flat Glass) are used as auxiliary materials. Since the energy required for melting is smaller than raw materials, cullets contribute to energy saving. There are two types of cullet : internal cullet that is reused within process, and external cullet that is collected (recycled) from other processes.
Emissions are oxidized gas generated from melting furnace and also wastewater.



Float Glass Manufacturing Process

<Sputtering process>
Float Glass is loaded on conveyor and cleaned to remove contamination before sputtering. Then it is inserted into vacuum chamber with low pressure argon gas. Magnetron induces to form argon plasma, activating high energy argon cations, which attack target materials (metal or metal oxide). The atom of targets will be ejected and deposited (sputtered) onto Float Glass surface to form ultra-thin and uniform film. Various composition can be made by changing target materials and sputtering conditions. The sputtered Glass is then annealed to enhance adhesion and durability. After inspecting layer and

optical characteristics, it is shipped by wooden box. Electricity and water is used as utilities, and emission is wastewater.



Magnetron Coated Glass Manufacturing Process

TRANSPORT AND INSTALLATION (A4-A5)

Transportation process to construction sites(A4 stage) is considered based on distance between factory and major cities. The distance is 500 km by means of trucks.

PRODUCT USE AND MAINTENANCE (B1-B7)

Window glass cleaning process as maintenance (B2 stage) is considered. Use of water and detergent is in accordance with EN 17074:2019, which is Product Category Rule for flat glass.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Energy considered for demolition of building (C1) is considered negligible. The transport distance and method to processing facilities (C2) is postulated to be 50km by truck for all scenarios.

In this EPD, end-of-life (EOL) scenarios have been developed for each material category.

Glass waste:
Waste treatment(C4 stage) of window glass is considered. It is landfilled 100% in accordance with current situation, without being recycled.

As this EPD does not include A5 stage, packaging wastes are considered in the end-of-life stage.

Wooden waste (packaging):
At the end of its lifetime, a timber product can have several end of life scenario options.Because of the uncertainties surrounding waste disposal practices in the future, exact methods of disposal at the end of life is hard to determine. In this EPD, 92.1% of product wastes are assumed to be chipped for the future use as fuel, 6.3% are assumed to be incinerated without energy recovery, and 1.6% are assumed to be landfilled.
The scenario is based on the results of a Survey of construction by-products in 2018 published by the Ministry of Land, Infrastructure and Transport, with the assumption of no material recycled between construction sites.

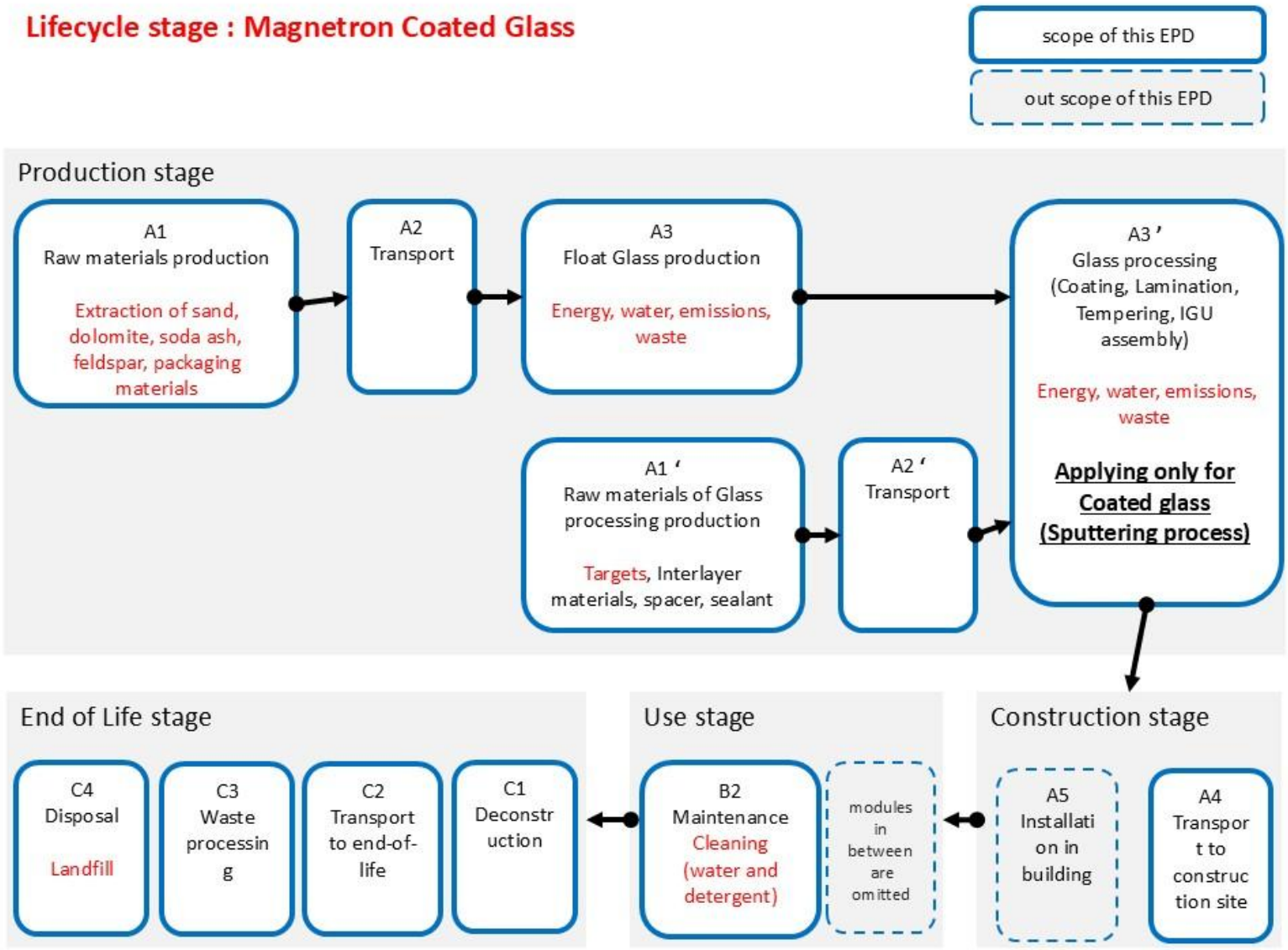
Plastic wastes (packaging):
50.4% are assumed to be collected and processed for recycling. 21.3% are assumed to be incinerated and the remaining 28.3% are assumed to be landfilled. The scenario is based on the report Results of the 2018 survey on the actual status of construction by-products from Construction Recycling Promotion Plan published by Japanese Ministry of Land, Infrastructure, Transport and Tourism.

Polyethylene film (packaging):
The EOL scenario is assumed to be 25% recycled, 57% energy recovery, 10% incinerated and 8% landfilled based on the report published by Ministry of Environment.

Glass waste(packaging):
This scenario is based on worst case scenario, considering that 100% of glass is landfilled in the end of life.

Based on EOL scenarios, the benefits and loads are considered in D for cases where there is recycling, reuse and energy recovery.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

This EPD includes all raw materials used to manufacture the product, transportation, energy and manufacturing waste, and final processing of the product. It includes all processes from procurement and processing of raw materials, product manufacturing, distribution and installation, and disposal of used products. Activities relating to capital goods production, infrastructure, manufacturing equipment production, and personnel were excluded from this calculation.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	Allocated by mass
Packaging material	Allocated by mass
Ancillary materials	Allocated by mass
Manufacturing energy and waste	Allocated by mass

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple factories
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	7.83

This product is manufactured at two plants: Cikampek plant and Samut Prakan plant. Since the raw materials and production processes are the same at both plants, the Cikampek plant, which is the main plant, is used as the representative case in this EPD. The only difference in environmental impact between the two plants is that the GWP-fossil (A1–A3) per ton is 7% higher at the Samut Prakan plant due to differences in production scale.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD System Verification v3.2.3. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.11 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent v3.11 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	1.09E+01	9.53E-01	4.73E+00	1.66E+01	7.96E-01	ND	ND	5.18E-01	ND	ND	ND	ND	ND	0.00E+00	8.08E-02	4.30E-02	7.20E-02	-4.21E-04
GWP – fossil	kg CO_2e	1.09E+01	9.53E-01	4.75E+00	1.66E+01	7.95E-01	ND	ND	5.15E-01	ND	ND	ND	ND	ND	0.00E+00	8.07E-02	1.74E-02	1.12E-01	-4.19E-04
GWP – biogenic	kg CO_2e	4.20E-02	0.00E+00	-2.79E-02	1.41E-02	0.00E+00	ND	ND	2.85E-03	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	2.57E-02	-3.97E-02	0.00E+00
GWP – LULUC	kg CO_2e	5.08E-03	5.19E-04	8.86E-03	1.45E-02	3.75E-04	ND	ND	4.31E-04	ND	ND	ND	ND	ND	0.00E+00	3.74E-05	2.26E-06	6.39E-05	-1.90E-06
Ozone depletion pot.	kg $CFC_{-11}e$	1.18E-07	1.27E-08	2.28E-08	1.53E-07	1.11E-08	ND	ND	1.50E-08	ND	ND	ND	ND	ND	0.00E+00	1.07E-09	6.50E-12	2.75E-09	-3.19E-12
Acidification potential	mol H^+e	1.13E-01	9.30E-03	2.41E-02	1.46E-01	1.99E-03	ND	ND	3.89E-03	ND	ND	ND	ND	ND	0.00E+00	3.70E-04	5.31E-06	7.50E-04	-2.23E-06
EP-freshwater[2)]	kg Pe	3.71E-03	9.13E-05	8.41E-03	1.22E-02	8.86E-05	ND	ND	1.39E-04	ND	ND	ND	ND	ND	0.00E+00	8.94E-06	2.52E-07	1.09E-05	-1.55E-07
EP-marine	kg Ne	1.32E-02	2.46E-03	6.74E-03	2.24E-02	4.69E-04	ND	ND	6.43E-04	ND	ND	ND	ND	ND	0.00E+00	1.36E-04	2.14E-06	2.91E-04	-5.91E-07
EP-terrestrial	mol Ne	1.55E-01	2.71E-02	5.39E-02	2.36E-01	5.07E-03	ND	ND	5.89E-03	ND	ND	ND	ND	ND	0.00E+00	1.49E-03	2.02E-05	3.16E-03	-6.15E-06
POCP ("smog")[3)]	kg NMVOCe	4.80E-02	8.47E-03	1.53E-02	7.17E-02	2.75E-03	ND	ND	2.48E-03	ND	ND	ND	ND	ND	0.00E+00	5.13E-04	5.77E-06	1.10E-03	-2.05E-06
ADP-minerals & metals[4)]	kg Sbe	2.44E-04	2.55E-06	2.98E-06	2.49E-04	2.66E-06	ND	ND	6.15E-06	ND	ND	ND	ND	ND	0.00E+00	2.65E-07	2.84E-09	2.06E-07	-5.93E-10
ADP-fossil resources	MJ	1.26E+02	1.26E+01	5.04E+01	1.89E+02	1.13E+01	ND	ND	1.65E+01	ND	ND	ND	ND	ND	0.00E+00	1.13E+00	8.44E-03	2.42E+00	-5.33E-03
Water use[5)]	m^3e depr.	2.70E+00	6.82E-02	8.79E-01	3.64E+00	6.34E-02	ND	ND	1.64E-01	ND	ND	ND	ND	ND	0.00E+00	6.36E-03	5.25E-04	1.07E-01	-8.18E-05

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	9.34E-07	6.56E-08	3.63E-07	1.36E-06	6.30E-08	ND	ND	4.33E-08	ND	ND	ND	ND	ND	0.00E+00	7.57E-09	1.30E-10	1.75E-08	-2.57E-11
Ionizing radiation[6]	kBq U235e	1.12E-01	1.10E-02	1.46E-02	1.38E-01	9.59E-03	ND	ND	1.71E-02	ND	ND	ND	ND	ND	0.00E+00	9.60E-04	4.04E-05	1.87E-03	-3.21E-05
Ecotoxicity (freshwater)	CTUe	2.84E+02	1.34E+01	8.99E+01	3.87E+02	1.30E+01	ND	ND	1.65E+01	ND	ND	ND	ND	ND	0.00E+00	1.31E+00	1.67E-01	2.43E+00	-1.08E-02
Human toxicity, cancer	CTUh	1.75E-09	1.82E-10	1.41E-09	3.34E-09	1.32E-10	ND	ND	6.17E-10	ND	ND	ND	ND	ND	0.00E+00	1.94E-11	1.38E-12	2.41E-11	-8.68E-14
Human tox. non-cancer	CTUh	7.06E-08	6.38E-09	9.27E-08	1.70E-07	7.05E-09	ND	ND	1.79E-08	ND	ND	ND	ND	ND	0.00E+00	7.76E-10	3.30E-11	5.22E-10	-2.60E-12
SQP[7]	-	2.08E+01	5.90E+00	8.23E+00	3.50E+01	8.32E+00	ND	ND	1.97E+00	ND	ND	ND	ND	ND	0.00E+00	8.35E-01	3.54E-01	5.76E+00	-3.50E-01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8]	MJ	4.33E+00	1.97E-01	4.87E+00	9.39E+00	1.63E-01	ND	ND	3.95E-01	ND	ND	ND	ND	ND	0.00E+00	1.63E-02	-8.16E-02	1.17E-02	8.18E-02
Renew. PER as material	MJ	0.00E+00	0.00E+00	2.45E-01	2.45E-01	0.00E+00	ND	ND	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	-2.26E-01	-1.94E-02	0.00E+00
Total use of renew. PER	MJ	4.33E+00	1.97E-01	5.11E+00	9.64E+00	1.63E-01	ND	ND	3.95E-01	ND	ND	ND	ND	ND	0.00E+00	1.63E-02	-3.07E-01	-7.65E-03	8.18E-02
Non-re. PER as energy	MJ	1.10E+02	1.26E+01	4.99E+01	1.72E+02	1.13E+01	ND	ND	7.80E+00	ND	ND	ND	ND	ND	0.00E+00	1.14E+00	-2.85E-01	1.86E+00	-5.33E-03
Non-re. PER as material	MJ	1.62E+01	0.00E+00	5.32E-01	1.67E+01	0.00E+00	ND	ND	8.66E+00	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	-4.21E-01	-1.63E+01	-1.70E-02
Total use of non-re. PER	MJ	1.26E+02	1.26E+01	5.04E+01	1.89E+02	1.13E+01	ND	ND	1.65E+01	ND	ND	ND	ND	ND	0.00E+00	1.14E+00	-7.06E-01	-1.45E+01	-2.23E-02
Secondary materials	kg	4.18E+00	7.84E-03	4.29E-03	4.19E+00	4.97E-03	ND	ND	2.94E-03	ND	ND	ND	ND	ND	0.00E+00	4.97E-04	1.54E-05	8.36E-04	-2.93E-06
Renew. secondary fuels	MJ	1.61E-03	5.74E-05	6.82E-03	8.48E-03	6.42E-05	ND	ND	6.77E-05	ND	ND	ND	ND	ND	0.00E+00	6.42E-06	1.51E-07	1.68E-05	-5.64E-08
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	6.02E-02	1.63E-03	1.83E-02	8.02E-02	1.62E-03	ND	ND	3.54E-03	ND	ND	ND	ND	ND	0.00E+00	1.60E-04	5.78E-06	-3.70E-02	-1.88E-06

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	2.26E-01	3.05E-02	4.81E-02	3.05E-01	2.56E-02	ND	ND	3.90E-02	ND	ND	ND	ND	ND	0.00E+00	2.58E-03	2.05E-04	4.06E-03	-3.82E-05
Non-hazardous waste	kg	2.39E+01	5.32E-01	5.74E+01	8.18E+01	4.93E-01	ND	ND	5.68E+00	ND	ND	ND	ND	ND	0.00E+00	4.97E-02	7.18E-03	2.64E+01	-7.83E-04
Radioactive waste	kg	2.72E-05	2.70E-06	3.45E-06	3.34E-05	2.35E-06	ND	ND	4.34E-06	ND	ND	ND	ND	ND	0.00E+00	2.35E-07	9.83E-09	4.58E-07	-7.75E-09

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	2.64E+00	0.00E+00	1.23E+00	3.87E+00	0.00E+00	ND	ND	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	1.60E-02	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	5.40E-03	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	1.65E-01	0.00E+00	0.00E+00
Exported energy – Electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	2.50E-02	0.00E+00	0.00E+00
Exported energy – Heat	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	1.40E-01	0.00E+00	0.00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1.09E+01	9.48E-01	4.76E+00	1.66E+01	7.91E-01	ND	ND	5.13E-01	ND	ND	ND	ND	ND	0.00E+00	8.03E-02	1.75E-02	1.11E-01	-4.20E-04
Ozone depletion Pot.	kg $CFC_{-11}e$	9.47E-08	1.02E-08	1.81E-08	1.23E-07	8.91E-09	ND	ND	1.37E-08	ND	ND	ND	ND	ND	0.00E+00	8.62E-10	5.47E-12	2.21E-09	-2.67E-12
Acidification	kg SO_2e	9.49E-02	7.36E-03	1.98E-02	1.22E-01	1.60E-03	ND	ND	3.30E-03	ND	ND	ND	ND	ND	0.00E+00	2.76E-04	4.00E-06	5.54E-04	-1.78E-06
Eutrophication	kg PO_4^3e	1.67E-01	1.05E-03	5.95E-03	1.74E-01	3.96E-04	ND	ND	4.92E-04	ND	ND	ND	ND	ND	0.00E+00	6.91E-05	1.17E-06	2.44E-04	-2.93E-07
POCP (“smog”)	kg C_2H_4e	1.97E-03	4.40E-04	1.03E-03	3.43E-03	1.47E-04	ND	ND	1.98E-04	ND	ND	ND	ND	ND	0.00E+00	2.25E-05	4.14E-07	4.68E-05	-1.48E-07
ADP-elements	kg Sbe	2.20E-04	2.48E-06	2.95E-06	2.26E-04	2.59E-06	ND	ND	5.55E-06	ND	ND	ND	ND	ND	0.00E+00	2.58E-07	2.72E-09	1.99E-07	-5.79E-10
ADP-fossil	MJ	1.24E+02	1.24E+01	5.02E+01	1.87E+02	1.11E+01	ND	ND	1.62E+01	ND	ND	ND	ND	ND	0.00E+00	1.12E+00	7.81E-03	2.39E+00	-4.83E-03

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	1.09E+01	9.53E-01	4.76E+00	1.66E+01	7.96E-01	ND	ND	5.15E-01	ND	ND	ND	ND	ND	0.00E+00	8.08E-02	1.74E-02	1.12E-01	-4.21E-04

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Market for electricity, medium voltage, Indonesia, Ecoinvent
Electricity CO2e / kWh	1.17 kg CO_2e / kWh
District heating data source and quality	-
District heating CO2e / kWh	-

Transport scenario documentation A4

Scenario parameter	Value
Vehicle type used for transport	Transport, freight, lorry, all sizes, EURO 6 to generic market for transport, freight, lorry, unspecified
Average transport distance, km	500
Capacity utilization (including empty return) %	50%
Bulk density of transported products	-
Volume capacity utilization factor	1

Use stages scenario documentation - B2 Maintenance

Scenario information	Value
Maintenance process / Description or source where description can be found	Cleaning of the window
Maintenance cycle / Number per RSL or year (Not applicable if only B2 is declared)	30
Ancillary materials for maintenance, e.g. cleaning agent, specify materials / kg / cycle	1
Waste material resulting from maintenance (specify materials) / kg	21
Net fresh water consumption during maintenance / m2	0.02
Energy input during maintenance, e.g. vacuum cleaning, energy carrier type, e.g. electricity, and amount, if applicable and relevant / kWh	0

End of life scenario documentation

Scenario information	Value
Collection process – kg collected separately	10.03
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	0.016
Recovery process – kg for energy recovery	0.005
Disposal (total) – kg for final deposition	10.006
Scenario assumptions e.g. transportation	Transported 50 km by lorry

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

D.V, as authorized verifier acting for EPD HUB Limited

23.01.2026

ANNEX

Below is a table of Magnetron Coated Glass by product thickness and their corresponding mass. The carbon emissions attributed to each product have been determined below.

The A1 raw materials, A2 transportation, and A3 manufacturing energy for the base float glass are proportional to its weight, while the A1 raw materials, A2 transportation, and A3 manufacturing energy for the sputter coating remain constant regardless of the product thickness.

	Product Thickness mm	Product Weight kg/m^2	A1 kgCO2e/m2	A2 kgCO2e/m2	A3 kgCO2e/m2	A1-A3 kgCO2e/m2
1	3.0	7.50	8.20	0.72	4.75	13.67
2	3.2	8.00	8.73	0.76	4.75	14.25
3	4.0	10.00	10.89	0.95	4.75	16.60
4	5.0	12.50	13.58	1.19	4.75	19.53
5	6.0	15.00	16.27	1.43	4.75	22.45
6	8.0	20.00	21.66	1.90	4.75	28.31
7	10.0	25.00	27.04	2.38	4.75	34.17
8	12.0	30.00	32.42	2.85	4.75	40.03