Environmental Product Declaration

In compliance with ISO 14025 and EN 15804:2012+A2:2019/AC: 2021 for

Float Glass

EPD of Multiple Products, based on Worst-case Results

EPD Program	Title	Details
International Climate Intelligence System 71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom info@climateintell.com	Registration #	ICIS-202404-41
	Date of Publication	16.05.2024
	Validity	15.05.2029
	Date of Revision	-

The most recent data needs to be provided through an EPD, which may be updated when circumstances change. Thereby the claimed validity is contingent upon ongoing validation at www.climateintell.com

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TABLE OF CONTENTS

1.0 PROGRAM INFORMATION

Program	International Climate Intelligence System 71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom info@climateintell.com
Product Group Classification	UN CPC 37113
Product Category Rules (PCR)	PCR 2020:17 Construction products (EN 15804:2012+A2:2019/AC:2021) Version 1.2.5 dated 01.11.2022. EN 17074:2019 Glass in building - Environmental product declaration - Product category rules for flat glass products. EN standard EN 15804 serves as the Core Product Category Rules (PCR)
Registration Number	ICIS-202404-41
Date of Publication	16.05.2024
Validity Date	15.05.2029
Geographical Scope	Global

2.0 INTRODUCTION

This report contains the environmental performance of the manufacturing process of Float Glass series by Emirates Float Glass LLC. This Environmental Product Declaration (EPD) has been developed using the Life Cycle Assessment (LCA) methodology. The environmental impact values calculated are expressed to 1 square meter of Float Glass series of Multiple Products, based on Worst-case Results.

The assessed life cycle includes all phases in the manufacturing process of Float Glass series in a “cradle to gate with options” scope. This LCA covers transportation of Raw materials, production, distribution of final product to the customer and end of life stages.

This EPD has been conducted according to the program operator regulations and it has been verified in accordance with the International Climate Intelligence System. The EPD regulation is a system for the international use of Type III Environmental Declarations, according to ISO 14025:2006. Not only the system, but also its applications, is described in the Programmer’s Product Category Rules (PCR). This report has been made following the specifications given in the European standard EN 15804:2012+A2:2019/AC:2021.

3.0 COMPANY INFORMATION

Emirates Float Glass (EFG) LLC is a world class, multi-award winning float glass facility based in Abu Dhabi UAE. Established in 2009 by Dubai Investments PJSC, the state-of-the-art facility has become a dominant player in the region for float glass in architectural and automotive applications, producing 600 tons of glass a day.

International Glass Processors have consistently trusted EFG to deliver to the highest standards of quality, delivery and service, whilst the company has won multiple Environmental, Safety and Business awards. Supplying a range of products to all international standards and to more than 65 countries spanning South America, Europe, Australia, Asia and Africa, "world class" has been in our DNA since inception.

Vision

EFG's vision is to maintain continual growth by creating our own benchmark; we compete with our own performance to improve further by establishing clear goals with a vision and unbreakable trust driven by customer satisfaction, integrity, teamwork, and innovation.

Certifications

Emirates Glass has achieved the below certifications:

- ISO 9001:2015 – Quality Management System (12 100 47402 TMS)
- ISO 14001:2015 – Environmental Management System (12 104 47402 TMS)
- ISO 45001:2018 – Occupational Health & Safety Management System (12 117 47402 TMS)
- In-Country Value Certificate (ICV) – (125614)
- CE Certificate from Glass and Glazing Federation (380)
- Green Industries Eco Label by EAD Abu Dhabi (EAD/EQS/2023/1451
- Bureau of Indian Standards License (FMCD/L-4100052260)

4.0 PRODUCT INFORMATION

4.1 Analyzed Product

The assessed system in this Environmental Product Declaration (EPD) comprises the full life cycle of Float Glass Series by Emirates Float Glass in its factory in Abu Dhabi, UAE.

This EPD is based on the Float Glass of Multiple Products, based on Worst-case Results. Manufactured in accordance with ASTM C 1036 and EN 572- Part 2 and ISO 16293-2.

4.2 Product Details

Product Specifications	Details
Glass Type	Float Glass Series (Clear Float, Tinted & Reflective Glass)
Color	Clear, Vitralite Bronze, Grey and Green
Thickness (mm)	4, 5, 6, 5.5, 8,10 & 12
Size (mm)	Min 2134x3300 and Max 2440x3660 & 3210x2250
Shape	Flat
Chemically Inert	Chemically non-reactive and impermeable
Recyclable	Can be recycled many times
Durability	Can be chemically tempered for greater hardness and scratch resistance
For more details https://www.efgme.com/download/EmiratesFloatGlass_Brochure.pdf	

This EPD covers below type series of glasses;

- Clear Float Glass
- Tinted Float Glass
- Reflective Glass–Vista Sol
- Reflective Glass–Vitra Cool

Impact values are based on the Float Glass of Multiple Products, on “Worst-case Results”.

4.3 Product Specifications

For detailed product specifications click https://www.efgme.com/ and https://www.efgme.com/download/EmiratesFloatGlass_Brochure.pdf

4.4 Product Application

Float Glass finds its way through various secondary processing, such as; heat treatment, Lamination and institution to Door, Window and Glazing Applications both for the building and automotive industry. Float glass allows great level of customization and flexibility through downstream processing that makes it a versatile building material.

Tinted Float Glass widely use in interior and exterior decoration of buildings, mirror, furniture, bathroom and etc. There are various color options that provide flexibility for original and innovative architectural design, even in the spaces that require low reflection

Reflective Glass–Vista Sol & Vitra Cool Coated on clear or tinted subtracts, the products are designed to cut down undesirable heat gain through windows & glazing while offering a smooth mirror like finish towards the exteriors. EFG reflective glass allows longer shelf life and are very process friendly compared to sputter coated reflective products.

The product range has been designed to cater the rising demand of energy saving float glass products design whilst combining features for occupant comfort & Privacy.

5.0 LCA INFORMATION

5.1 Declared Unit

The Declared Unit of the Life Cycle Assessments is 1 Square meter of one millimeter (1mm) thickness of Float Glass Series that weight 2.5 kg. This EPD provides Float Glass Series of Multiple Products, based on Worst-case Results.

Conversions Factors

The LCA study included in this EPD declares environmental impact of 1 square meter Float Glass Series of 1 mm thickness with a weight of 2.5 kg. To get GWP values for other thicknesses, multiply GWP results by the thickness of glass.

Service Life

Reference service life of 30 years is used for this EPD, as prescribed in EN 17074:2019.

5.2 Time representativeness

Manufacturing facility specific data from Emirates Float Glass are based on 1 year average for process data (Reference year July 2022 to Jun 2023). The following rules for time scope of data were applied - < 10 years for background data and < 2 years for manufacturer's data.

5.3 LCA Software and Database

Version 3.16.2.4 of software Air.e LCA™ with Ecoinvent™ 3.9.1 database has been used for LCA modeling and impacts calculations.

5.4 System Boundaries

This EPD covers all product stages from “cradle to gate with options”, i.e this LCA covers Production stage A1-A3, Transportation A4, End of life stages C1-C4 and Resource recovery stage D according to EN 15804 + A2/AC:2021.

The procedures that are not controlled by the company, but are included in this environmental study, are:

- The extraction and production of fuels and electricity.
- The production of the machinery, buildings, and vehicles.

All related direct and indirect environmental impacts related to these elements have been calculated and were included in the LCAs in this EPD.

Upstream Processes (**A1: Raw Material Supply**): Production of the product starts with mainly raw material production and transportation from different parts of the world

and some locally sourced. 'Raw material supply' includes raw material extraction before production and Glass Cullet.

Core Processes (**A2: Transportation**): Transport is relevant for delivery of raw materials to the plant. Raw materials transported from Saudi Arabia 59.60%, United Arab Emirates 12.97%, Oman 6.64%, Turkey 19.10%, France 0.09% and India 0.05%. In our case, the modelling included raw material's road and sea distances (average values). Glass Cullet's are delivered to EFG factory gate by suppliers.

Manufacturing (module A3): The processes that are included in the manufacturing phase are the batch preparation, charging, melting/conditioning, coating, annealing, cutting and stacking which energy consumption, auxiliary material consumption, waste and gaseous emissions have been modeled. During the manufacturing process, there is created glass waste – 100% of glass wastes are sent for recycling.

Transport (module A4): To create a scenario of the A4 phase, all the products sold from July 2022 to June 2023 has been analyzed as representative of the international transport. The transport means 3.5-7.5t & >32t trucks, Euro 6.

Scenario Details	Description
Vehicle used for transport	3.5-7.5t & >32t trucks, Euro 6.
Vehicle capacity	3.5 -7.5 tons and >32 tons
Fuel type and consumption	Diesel, 0.38 liters per km
Capacity utilization	100% as assumed in Ecoinvent
Bulk transportation	Mass of the transported product.

Dismantling/demolition (module C1)

The glass installed in various sites are demolished manually, hence the environmental impacts of Module C1 are negligible.

Transportation of demolished items (module C2)

With the recent goals set by the UAE on glass recycling, it is assumed that 75% of the demolished glass is sent for sorting and recycling whereas the remaining 25% is sent to a landfill. At a collection rate of 100%, the transports are carried out by a <32 ton truck at an average distance of 50 kms to the recycling center and landfill site. This is a conservative assumption.

Type	Capacity utilization	Type of vehicle	Average distance
Truck	75%	Euro 3.5-7.5t	50 km

Waste processing (module C3)

Glass must be mechanically separated from other material surrounding them prior to recycling so that the glass can be made available to a downstream product system as secondary material. Hence, the environmental impacts of sorting of glass is considered in module C3.

Disposal (module C4)

25% of the demolished glass is assumed to be landfilled and the corresponding environmental impacts are considered in module C4.

Reuse, Recycling, and Recovering Potential (module D)

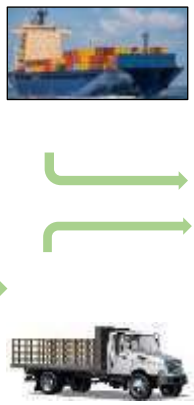
Module D represents the recycling benefits of the used glass and packaging materials.

Manufacturing and System Boundaries Diagram

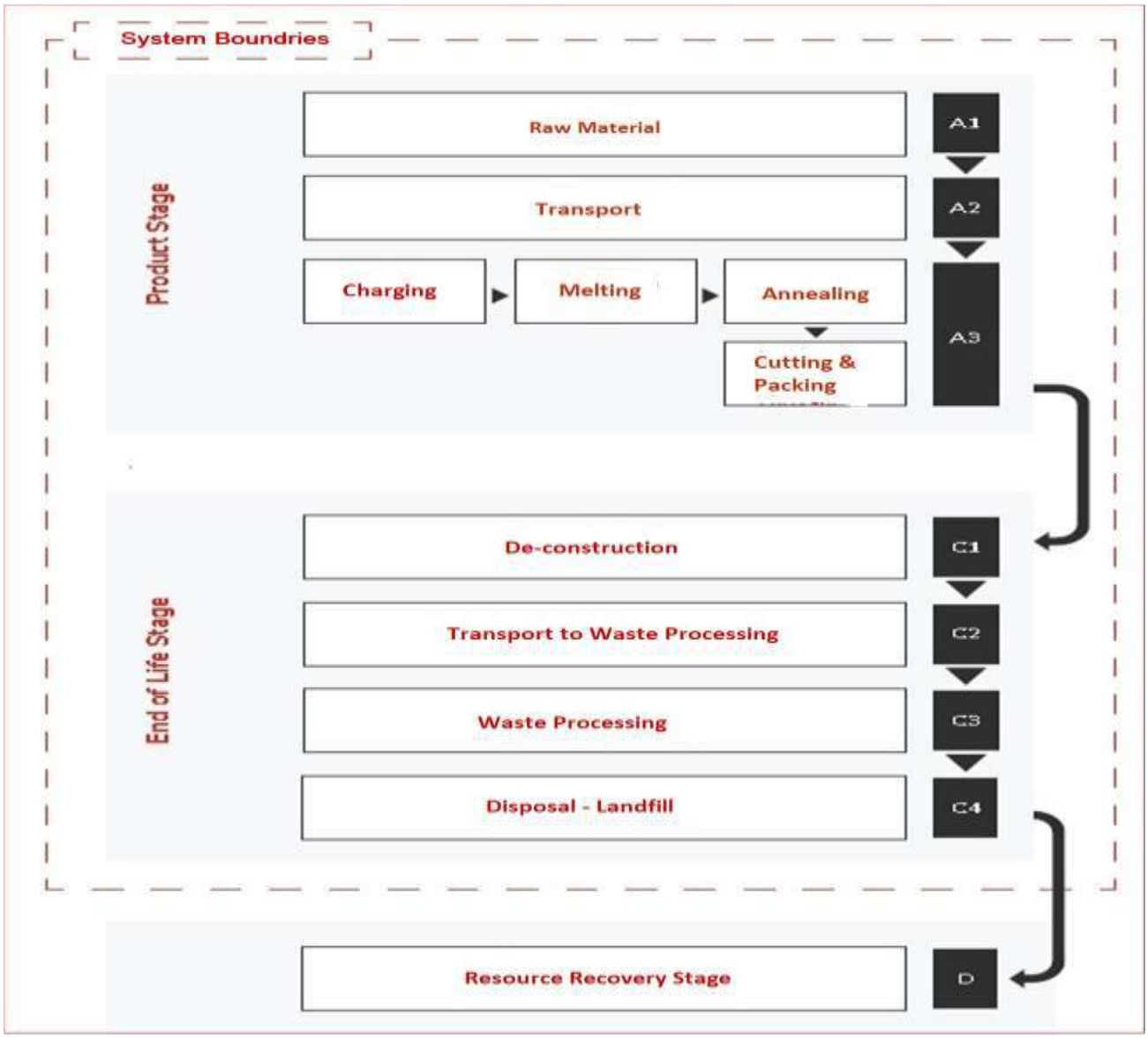
	Production Stage			Construction Process Stage		Use Stage							End of Life Stage				Resource Recovery Stage
	Raw Materials	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-construction Demolition	Transport	Waste Processing	Disposal	Reuse Recovery 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**	ND	ND	ND	ND	ND	ND	ND	ND	**X**	**X**	**X**	**X**	**X**
Geography	GLO	GLO	UAE	GLO	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data	GWP > 90%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	>10%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	One manufacturing center				-	-	-	-	-	-	-	-	-	-	-	-	-

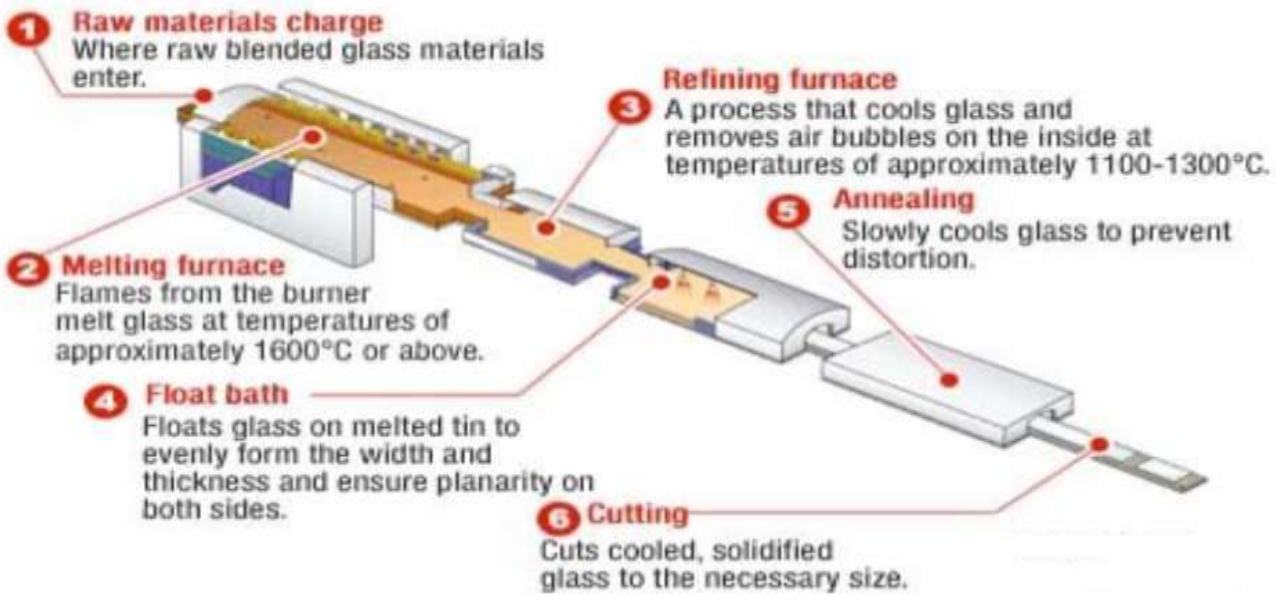
X = Included, ND=Module not declared, NR= Module not relevant

Modules from A5 to B7 are not included (X refers to considered stage; N refers to not relevant stage and ND to not declared stage).

Scope of this Life Cycle Assessment 'Cradle to Gate with Options'					
A1 Raw Materials Production	**A2 Transport raw materials**	**A3 Manufacture**	**A4 Distribution**	**End of use Stage (C1-C4)**	**Recovering and Recycling (D)**
			  		
Raw Materials and Chemicals	Transport from supplier by Road & Sea	Charging, Melting, Annealing, Cutting & packing	Transport to customers by sea and rods	Demolition, transport, disposal.	Reuse, recovery and recycling potential

5.5 The following diagram is a more detailed description of the modules.





5.6 Content Declaration

Product Components	Weight %	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Silica Sand	49.8	0	0
Dolomite	10.7	0	0
Limestone	5.6	0	0
Soda Ash	15.2	0	0
Sodium Sulphate	0.6	0	0
Iron Oxide & Others	0.2	0	0
Glass Cullet	17.9	5.6	0
Total	**100**	**5.6**	**0**

Thickness(mm)	4	5	6	8	10	12
Quantity of glass for 1 m² of product (kg)	10	12.5	15	20	25	30

Packaging Materials			
Packaging Materials	**Weight Kg**	**Weight % (Versus the Product)**	**Weight biogenic carbon, kg C/kg**
Wooden Crate*	0.65	3.2	0
Metal Strap	0.08	0.4	0
LDPE Bags	0.08	3.1	0
Total	0.81	8.8	0
*Biogenic carbon content is not presents since the packaging weights less than a 5% over the product's weight.			

5.7 Substances listed in the "Candidate List of SVHC"

During the life cycle of the product, no hazardous substances listed in the "Candidate List of substances of very high concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product.

5.8 More information

Cut-off rules: more than 99% of the materials and energy consumption have been included. The Polluter Pays Principle and the Modularity Principle have been followed.

Allocations: The allocation of common inputs and outputs is based on the general allocation rule what represents the proportion of production of every specific product in overall production expressed in square meter. Generic process data for production of input materials were used.

Electricity: A specific dataset with the Life Cycle Inventory (LCI) corresponding to the electricity mix in Abu Dhabi, United Arab Emirates, has been used for this LCA.

Calculation Rules: Datasets from Ecoinvent 3.9.1 with emission factors for raw materials and generic chemicals have been characterized to adjust them to the characteristics of manufacturing of suppliers or counties where suppliers are located. Specific datasets with the emissions factors corresponding to the fuel combustion of production plant and machinery have been developed for these LCAs. Indirect emissions due to diesel production and transportation are also included in the environmental impact. Minor components are not directly related to the product, with less than 1% impact, such as office supplies, has been excluded from the assessment.

All transports of components have been included in the LCA considering real distances travelled by materials used for production. It is estimated in a global scale according to Ecoinvent™ criteria. As exact port locations are not known in detail, transport distances have been calculated from a one of the ports in the country of origin to the factory. Operation in port has also been excluded. Road distances calculated using Google Maps. Maritime distances calculated using Marine Traffic Voyage Planner.

By Products Assignment: There are no by-products in this Environmental Product Declaration. Hence no allocation had to be applied.

6.0 ENVIRONMENTAL PERFORMACE

6.1 Potential Environment Impacts

In the following tables, the environmental performance of the declared units "1 Square meter of one millimeter (1mm) thickness of Float Glass Series that weight 2.5 kg" is presented for the Emirates Float Glass. During the assessment it was not evident to distinguish the differences in the consumption of electricity, water and raw material during the manufacturing. Hence, the calculation is based on total production vs total consumption against manufacturing of the product. Environmental impacts are calculated using the EF-3.1, (ILCD).

Conversions Factors

The LCA study included in this EPD declares environmental impact of 1 square meter Float Glass Series of 1 mm thickness with a weight of 2.5 kg. To get GWP values for other thicknesses, multiply GWP results by the thickness of glass as below;

Example: GWP-GHG value of 1 square meter of Float Glass series of 1 mm thickness = Product Stage (A1+A2+A3) = (2.63E+00) + (2.51E-01) + (1.61E+00) = 4.49E+00 i.e 4.49 kg CO2e. For 5mm thickness = 22.45 kg CO2e.

Float Glass Series

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

Core Environmental Impact Indicators

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	2.61E+00	2.51E-01	1.61E+00	1.93E-02	ND	ND	0.00E+00	1.46E-02	5.80E-02	1.93E-02	-1.39E+00
Climate change (GWP) – biogenic	kg CO2e	2.36E-02	1.23E-05	4.73E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.89E-02	9.65E-03	-1.22E-02
Climate change (GWP) – LULUC	kg CO2e	1.39E-02	5.01E-05	8.79E-05	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.74E-04	5.80E-05	-3.28E-03
Climate change (GWP) – total	kg CO2e	2.65E+00	2.51E-01	1.61E+00	1.93E-02	ND	ND	0.00E+00	1.46E-02	8.71E-02	2.90E-02	-1.43E+00
Ozone depletion	kg CFC11e	1.99E-07	1.45E-08	1.66E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	6.13E-09	2.05E-09	-1.39E-07
Acidification	mol H+e	2.44E-02	2.44E-03	3.00E-03	7.50E-06	ND	ND	0.00E+00	5.00E-06	3.68E-04	1.23E-04	-1.08E-02
Eutrophication, aquatic freshwater	kg PO4e	3.45E-03	7.02E-06	7.05E-05	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.17E-05	3.91E-06	-1.09E-03
Eutrophication, aquatic freshwater	Kg P eq	1.12E-03	2.29E-06	2.30E-05	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.82E-06	1.27E-06	-3.53E-04
Eutrophication, aquatic marine	kg Ne	4.16E-03	6.15E-04	7.94E-04	3.37E-06	ND	ND	0.00E+00	2.56E-06	1.67E-04	5.56E-05	-2.59E-03
Eutrophication, terrestrial	mol Ne	6.26E-02	6.84E-03	8.53E-03	3.75E-05	ND	ND	0.00E+00	2.75E-05	1.74E-03	5.80E-04	-2.91E-02
Photochemical ozone formation	kg NMVOCe	1.34E-02	1.77E-03	5.36E-03	1.00E-05	ND	ND	0.00E+00	7.58E-06	1.30E-03	4.35E-04	-9.22E-03
Abiotic depletion, minerals & metals	kg Sbe	5.51E-05	1.00E-07	9.91E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-07	4.37E-08	-1.75E-05
Abiotic depletion of fossil resources	MJ	3.45E+01	9.89E-01	5.71E+01	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.20E-01	1.40E-01	-2.18E+01
Water use	m3e depr.	2.56E+00	2.23E-03	4.67E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.32E-03	1.11E-03	-8.44E-01

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all 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 experienced with the indicator. "Reading example: 1.57E-03 = 1.57*10-3 = 0.00157"

Additional Environmental Impact Indicators

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	3.52E-07	2.56E-09	1.44E-08	3.59E-11	ND	ND	0.00E+00	2.63E-11	6.20E-07	2.07E-07	-1.96E-07
Ionizing radiation, human health	kBq U235e	1.51E-01	4.23E-03	4.56E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.05E-03	1.02E-03	-8.18E-02
Eco-toxicity (freshwater)	CTUe	7.23E+01	2.73E-01	4.98E+00	5.75E-05	ND	ND	0.00E+00	4.25E-05	9.33E-01	3.11E-01	-1.06E+01
Human toxicity, cancer effects	CTUh	1.08E-08	3.49E-11	1.87E-10	6.63E-13	ND	ND	0.00E+00	5.01E-13	8.24E-09	2.75E-09	-9.15E-09
Human toxicity, non-cancer effects	CTUh	4.55E-08	3.62E-10	2.97E-09	1.28E-11	ND	ND	0.00E+00	9.81E-12	8.47E-10	2.82E-10	-1.69E-08
Land use related impacts/soil quality	Dimensionless	7.37E+02	1.24E-01	7.47E-01	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.24E+00	4.13E-01	-7.24E+02

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.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	2.63E+00	2.51E-01	1.61E+00	1.93E-02	ND	ND	0.00E+00	1.46E-02	5.82E-02	1.94E-02	-1.42E+00

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	1.01E+02	6.25E-03	5.08E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.58E-02	8.60E-03	-9.90E+01
Renewable PER used as materials	MJ	9.03E-03	2.75E-05	2.49E-04	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.78E-05	1.26E-05	-4.23E-03
Total use of renewable PER	MJ	1.01E+02	6.28E-03	5.10E-02	0.00E+00	ND	ND	0.00E+00	0.00E+00	2.58E-02	8.61E-03	-9.90E+01

Non-renew. PER used as energy	MJ	3.45E+01	9.90E-01	5.70E+01	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.20E-01	1.40E-01	-2.18E+01
Non-renew. PER used as materials	MJ	1.40E-05	1.65E-08	2.33E-07	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.17E-07	3.90E-08	-3.30E-06
Total use of non-renewable PER	MJ	3.45E+01	9.90E-01	5.70E+01	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.20E-01	1.40E-01	-2.18E+01
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	0.00E+00	3.04E+02	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Waste

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	0.00E+00	2.21E+02	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	1.35E+05	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	1.01E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.82E+04
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Biogenic Carbon Content

Details	Unit	A1-A3
Biogenic carbon content in product	Kg C	0
Biogenic carbon content in accompanying packaging	Kg C	0

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2. "Reading example: 1.57E-03 = 1.57*10-3 = 0.00157"

Disclaimer: "According to the EN 15804:2012+A2:2019 standard, the LCIA results are relative expressions translating impacts into environmental themes such as climate change, ozone depletion, etc. (midpoint impact categories). Thus, the LCIA results do not predict impacts on category endpoints such as impact on the extinction of species or human health. In addition, the results do not provide information about the exceeding of thresholds, safety margins or risks".

6.2 Interpretation of LCA Study Results

In general terms, as it is shown in the table of core environmental impact indicators, A1-A3 modules have the higher impact, representing above 80% of the whole impact. A4 module has a less impact. C2 and C4 module has little impact too, representing at most 0.16% and 0.01% respectively of the whole impact. Refer the below table 1 for more detailed explanations.

Concluding, the study provides fair understanding of environmental impacts during the various life cycle stages of Float Glass Series production. It also identifies the hot spots in the value chain where improvement activities can be prioritized and accordingly actions can be planned. The scope covers the ecological information to be divided into raw material production (A1), transportation (A2), manufacturing (A3), delivery (A4), product dismantling (C1), transport of dismantled product to site (C2), waste processing (C3), waste disposal (C4) as well as the end of life stage recycling (D) considerations.

Table 1 - Interpretation of most significant contributors to life cycle parameters (Float Glass Series)

Impact Indicator	Description	Most significant contributor
Depletion of abiotic resources – fossil fuels	Indicator of the depletion of natural fossil fuel resources.	The total cradle to gate impact is 9.27E+1 (92.66) MJ. In A1 – A3, the production process (61.64%) and raw material (37.29%) has the highest impacts. A total credit of -2.18E+01 MJ is taken in module D.
Climate Change (Global Warming Potential- GWP-GHG)	Indicator of potential global warming due to emissions of greenhouse gases to the air. Divided into 3 subcategories based on the emission source: (1) fossil resources, (2) bio-based resources, and (3) land use change.	The total cradle to gate impact is 4.49E+00 (4.49) kg CO2 eq. In A1 – A3, the raw material (58.13%) followed by production (35.86%) has the highest impacts. A total credit of -1.42E+00(1.42) kg CO2 eq is taken in the module D.
Climate change (fossil)	Indicator of the Climate change is largely driven by the release of greenhouse gases like CO 2.	The total cradle to gate impact is 4.47E+00 (4.47) kg CO2 eq. In A1 – A3, the raw material (58.39%) followed by production (36.01%) has the highest impacts. A total credit of -1.39E+00(1.39) kg CO2 eq is taken in the module D.

7.0 MANDATORY STATEMENTS

Explanatory material can be obtained from EPD owner and/or LCA author. The verifier and The Program Operator do not make any claim or present any responsibility about the legality of the product. The EPD owner has the sole ownership, liability, and responsibility for the EPD. The LCA Author shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

EPDs within the same product category but registered in different EPD programmes 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; have equivalent content declarations; and be valid at the time of comparison.

8.0 ADDITIONAL INFORMATION

8.1 Action against Erosion, Environmental Restoration, and Landscaping of the work.

Application of measures to prevent erosion, restore the environment, and landscape the job includes restoring all elements immediately connected to it. The restoration of other related items indirectly is also suggested, including auxiliary facilities and landfill lands.

We recycle as many waste materials as possible. We follow a Just-in-Time manufacturing strategy to increase efficiency, reduce wastage and eliminate the need for excess storage.

Emirates Float Glass, is manufactured as per the best industry standards under technology license from Vitro (formerly PPG USA). EFG Float Glass offers excellent optical properties, smooth surface finish, perfect flatness, and lowest thickness tolerances which make it a perfect product for end-users as well as downstream processors.

8.2 Information related to Sector EPD

This is not a sector EPD.

8.3 Differences versus previous versions

This is the first version of the EPD.

9.0 VERIFICATION

Diffusion Institution	International Climate Intelligence System 71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom
Registration Number	ICIS-202404-41
Date of Publication	16.05.2024
Valid until	15.05.2029
Geographical Scope	Global
Product category rules (PCR): PCR 2020:17 Construction products (EN 15804:2012+A2:2019/AC:2021) Version 1.2.5 dated 01.11.2022. EN 17074:2019 Glass in building - Environmental product declaration - Product category rules for flat glass products. EN standard EN 15804 serves as the Core Product Category Rules (PCR)	
PCR review was conducted by: International Climate Intelligence System.	

Independent verification of the declaration and data, according to ISO 14025:2006 and ISO 14040: ☐ EPD Process Certification (internal) ☒ EPD Verification (external)
Third party verifier: Mr.Luis Manuel, San Adrián, Spain Accredited by: International Climate Intelligence System

10.0 CONTACT INFORMATION

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Verifier Details	Name: Mr.Luis Manuel Location: San Adrián, Spain Accredited by: International Climate Intelligence System

11.0 REFERENCES

LCA Report: Life Cycle Inventory of Float Glass Series by Emirates Float Glass LLC.

Software: Air.e LCA Version 3.14.0.15 www.solidforest.com

Main database: Ecoinvent 3.9.1 www.ecoinvent.org

Geographical scope of the EPD: Global

ISO 14040:2006 “Environmental management -- life cycle assessment -- principles and framework”;

ISO 14044:2006 “Environmental management -- life cycle assessment -- requirements and guidelines”;

ISO 14020:2000 “Environmental Labels and declarations - General Principles

ISO 14025:2006 “Environmental labels and declarations -- type III environmental declarations -- principles and procedures”.

EN 15804+A2:2019/AC:2021 European Committee for Standardization: Sustainability of construction works − Environmental product declarations − Core rules for the product category of construction products.

General Programme Instructions of the International Climate Intelligence System