

Environmental Product Declaration



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Coated Glass

From



Programme:	The International EPD® System, www.environdec.com
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Regional hub:	EPD Russia
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com or www.epdrussia.org



General information

Programme information

Programme:	The International EPD® System	
Regional Hub	EPD Russia	
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Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR):

PCR: Construction products 2019:14, version 1.3.4, c-PCR: Flat glass products used in buildings and other construction works

UNCPC Code - 3711 (Unworked glass, flat glass and pressed or moulded glass for construction; glass mirrors)

PCR review was conducted by:

Martin Erlandsson, IVL Swedish Environmental Research Institute, martin.erlandsson@ivl.se

Life Cycle Assessment (LCA)

LCA accountability:

CIS Center LCA team: Dmitrii Vadivasov (d.vadivasov@ciscenter.org), Valentina Luzanova (v.luzanova@ciscenter.org)

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

Third-party verifier: *Dr Hüdai Kara, Metsims Sustainability Consulting (www.metsims.com)*

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, 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 characterisation 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

Owner of the EPD:
Salavatsteklo, JSC

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Description of the organisation:

SALAVATSTEKLO Group is one of the largest and dynamically developing in Russia and neighboring countries. The group includes 3 plants for manufacturing glass and glass products with the widest range of products: JSC Salavatsteklo (Republic of Bashkortostan), JSC Saratovstroysteklo (Saratov region) and Salavatsteklo Kaspiy LLC (Republic of Dagestan). The experience of work on the Russian market of glass exceeds 60 years, experience on the international market - more than 30 years.

Our company currently operate in more than 20 countries around the world. Over 1300 employees of the company throughout Russia and the near abroad provide daily round-the-clock production and delivery of our products to customers.

JSC Salavatsteklo is one of the largest manufacturers of glass and glass products in Russia with flat glass manufacturing capacity of 1150 tons per day. The company produces float and float tinted glass, architectural and coated glass, mirrors, bottles, soluble sodium silicate, tempered construction and automotive glass, as well as double-glaized windows. JSC Salavatsteklo is capable to produce clear float glass and coated glass, conforming to International Quality standards, in a range of thickness from 1.8 to 12 mm for clear glass and from 4 to 12 mm for coated glass.

Product-related or management system-related certifications:

JSC Salavatsteklo manufacturing plant has certifications of quality management systems, environmental management systems, labor safety and careful manufacturing systems: ISO 9001:2015, IATF 1649:2016 and implement provisions of ISO 45001:2018, ISO 14001:2015, as well as has CE marking certificates on its products.

Name and location of production site(s):

Salavatsteklo, JSC
453253, Russian Federation, Republic of Bashkortostan, city of Salavat, 18, St.Industrialnaya

Product information

Product name:
Coated glass

Product identification:

JSC Salavatsteklo's Coated glass is manufactured according to national and international standards, such as GOST 31364-2014, GOST 33017-2014, GOST 33086-2014, GOST 34998-2023 and EN 1096-4, as well as according internatl technical specifications (TS 23.12.11-028-04616815-2020; TS 5913-026-04616815-2012). Products manufactured at Salavatsteklo, JSC according to EN standards have CE marking. Technical details of all glass products are available at www.salstek.com (or saltstek.ru) or upon a request.

Product description:

Coated glass (architectural glass) is used in buildings transforming the look of modern cities. Such glass transmits daylight well, protects from the sun and keeps heat inside the room. It can be of varying degrees of mirroring, neutral shades and coloured, without distorting the incoming daylight.

Depending on specifics of client's project several types of Coated glass could be produced:

- Standart
- Comfort°
- MultiComfort°
- MF

Range of sizes (mm): 2550x1605,
2250x3210, 2550x3210, 6000x3210.

Range of thickness: 4-12 mm



The EPD describes lifecycle impacts of coated glass (Standart, Comfort°, MultiComfort°, MF) with a representative thickness of 4 mm produced at JSC Salavatsteklo in 2023 (73.84% of the whole volume of coated glass with different thickness produced).

UN CPC code:

3711 (Unworked glass, flat glass and pressed or moulded glass for construction; glass mirrors)

Geographical scope:

Geographical scope for modules A1-A3 is Russia. All the main raw materials are sourced from Russian manufacturers. Several additives, mostly so called "targets" for magnetron sputtering used as coating, are supplied from abroad. The main manufacturing plant is located in Russia. Module A4 represents the distribution mainly to Russian market as well as to geographically distributed locations throughout the near and far abroad, including customers in Asia and Middle East.

The end-of-life module is representative of a Russian market, common practice for construction waste utilization is considered.

LCA information

Declared unit:

1 m² of Coated glass weighing 9.58 kg with 4 mm thickness.

Reference service life:

It is assumed that Coated glass is integrated in building (module B) and thereof has the same service life as the building (30-50 years).

Time representativeness:

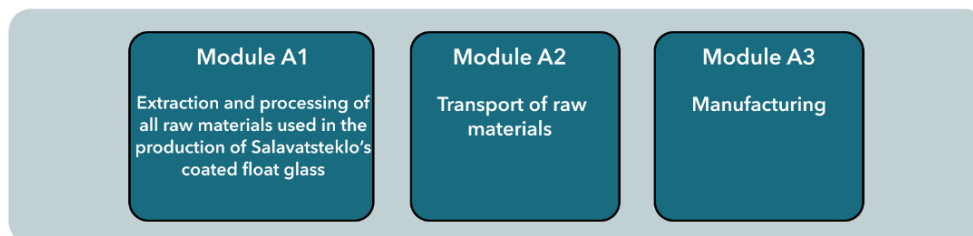
Specific data from the main manufacturing site collected for the year 2023.

Database(s) and LCA software used:

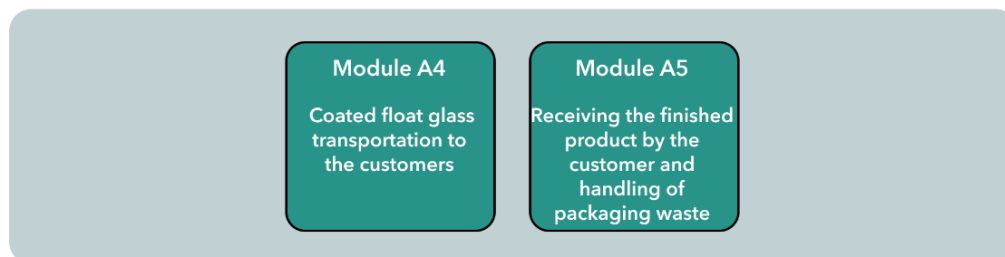
Ecoinvent 3.9.1 cut-off, EF 2.0, ELCD 3.2 Databases and OpenLCA 1.9.0 Software.

Description of system boundaries:

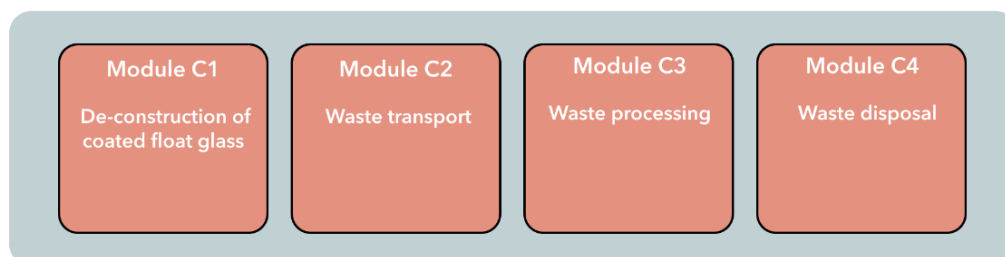
PRODUCT STAGE (MODULES A1-A3)



CONSTRUCTION PROCESS STAGE (MODULES A4-A5)



END-OF-LIFE STAGE (MODULES C1-C4)



BENEFITS AND LOADS BEYOND THE PRODUCT SYSTEM BOUNDARY (MODULE D)

Benefits and loads from recycling, re-use and utilization of flows leaving the product system

This EPD is based on cradle-to-grave with modules A1-A3, C1-C4, and module D based on the application of LCA methodology according to reference PCR. The following life cycle stages are considered:

- **Product stage (Modules A1-A3):**
 - Module A1: extraction and processing of all raw materials used in the production of JSC Salavatsteklo clear float used for manufacturing of coated glass (quartz sand, dolomite, soda ash, limestone, feldspar, sodium sulphate, nitrogen), as well as production of packaging (soft wood frames, steel tapes and brackets, PE film, "transfer powder") and auxiliary materials (tin,

oxygen, argon, silica, selenium). Production of substances and metals used as “targets” for applying on a surface of a clear float glass as a “coat”;

- Module A2: transport of raw materials including auxiliary materials and packaging to the manufacturing site considering actual distances from raw materials suppliers, as well as differences in used type of transport (lorry, railway transport, sea freight) used for each raw material supply in 2023.
- Module A3: manufacturing of coated glass by magnetron sputtering technology, production and supply of energy used in the main manufacturing process (electricity, natural gas, process steam, water) and production waste processing - waste transportation by lorry and landfill scenario is considered.

The electricity used in the manufacturing processes in A3 is sourced from the Russian power grid, with climate impact of 0.713 kg CO₂ eq./kWh (dataset reference year dataset - 2022) based on GWP-GHG indicator from the Ecoinvent 3.9.1 database.

- **Construction process stage (Modules A4-A5):**

- Module A4: coated glass transportation to the customers. The module is based on weighted average of 70% largest deliveries in 2023 considering distribution by lorry trucks and railway freights supplies.
- Module A5: receiving the finished product by the customer and handling of packaging waste. The packaging waste on a landfill scenario has been considered.

- **End-of-life stage (Modules C1-C4)**

- Module C1: de-construction of coated glass from the building (any other goods) it is integrated in.
- Module C2: coated glass after losing its utilization properties transportation to the waste processing.
- Module C3: product waste processing.
- Module C4: product waste disposal/utilization. Landfilling considered as the basic scenario for the coated glass at a waste status.

- **Benefits and loads beyond the product system boundary (Module D)**

- Future reuse, recycling, or energy recovery potentials. Since the recycling rate is considered as 0%, no benefit is generated.

Cut-off criteria:

Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included. 1% cut-off rule according to the reference PCR is applied.

Allocation:

Allocation in Module A3 is excluded by collecting primary data for all the main processes directly. Allocation in other Modules of the coated glass according to datasets taken.

Conversion Factors

The LCIA impacts provided in the EPD is for declared unit of 1m² coated glass with 4 mm thickness and a weight of 9.58 kg. Since the allocation by mass could be applied, the following conversion factors could be used to calculate the environmental impacts of different thicknesses of coated glass.

Thickness, mm	4.0	5.0	6.0	8.0	10.0	12.0
Conversion factor	1	1.27	1.53	2.05	2.54	3.08

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	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	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	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	RU	RU	RU	GLO	GLO	-	-	-	-	-	-	-	RU	RU	RU	RU	GLO
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

RU = Russian Federation; GLO = Global

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Float glass	9.575	0	0
External glass scrap (post-consumer)	0.0048	100	0
SiAl magnetron target	2.10E-04	0	0
ZnAl magnetron target	1.29E-04	0	0
ZrOx magnetron target	3.11E-07	0	0
Ag magnetron target	9.62E-05	0	0
NiCr magnetron target	7.84E-05	0	0
Cr magnetron target	9.32E-05	0	0
Si magnetron target	3.86E-07	0	0
TiOx magnetron target	5.47E-05	0	0
NbOx magnetron target	1.48E-05	0	0
TOTAL	9.58	0.048	0
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Wooden caps	6.85E-02	0.71	0.49
Metal straps	4.07E-03	0.01	0
PE film	1.23E-03	0.04	0
TOTAL	7.38E-02	0.77	0.49

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per 1 m ² of coated glass										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	1.14E+01	3.13E-01	8.85E-03	ND	0.00E+00	9.27E-07	0.00E+00	4.32E-06	0.00E+00
GWP-biogenic	kg CO ₂ eq.	3.66E-03	8.77E-04	1.21E-01	ND	0.00E+00	1.65E-09	0.00E+00	5.03E-09	0.00E+00
GWP-luluc	kg CO ₂ eq.	9.13E-03	1.09E-03	1.26E-05	ND	0.00E+00	6.74E-09	0.00E+00	1.86E-08	0.00E+00
GWP-total	kg CO ₂ eq.	1.14E+01	3.15E-01	1.30E-01	ND	0.00E+00	9.35E-07	0.00E+00	4.35E-06	0.00E+00
ODP	kg CFC 11 eq.	9.13E-03	1.09E-03	1.26E-05	ND	0.00E+00	6.74E-09	0.00E+00	1.86E-08	0.00E+00
AP	mol H ⁺ eq.	6.30E+01	2.92E-02	3.06E-04	ND	0.00E+00	1.59E-07	0.00E+00	7.47E-07	0.00E+00
EP-freshwater	kg P eq.	2.37E-02	4.70E-04	4.84E-05	ND	0.00E+00	2.67E-09	0.00E+00	7.57E-09	0.00E+00
EP-marine	kg N eq.	4.47E-04	1.20E-06	2.73E-07	ND	0.00E+00	5.90E-12	0.00E+00	6.38E-11	0.00E+00
EP-terrestrial	mol N eq.	2.79E-01	5.17E-03	1.19E-04	ND	0.00E+00	2.96E-08	0.00E+00	8.43E-08	0.00E+00
POCP	kg NMVOC eq.	2.73E-08	9.72E-10	2.88E-11	ND	0.00E+00	6.01E-15	0.00E+00	4.74E-14	0.00E+00
ADP-minerals&metals*	kg Sb eq.	2.30E-07	1.58E-08	1.23E-09	ND	0.00E+00	8.68E-14	0.00E+00	1.92E-12	0.00E+00
ADP-fossil*	MJ	4.22E-01	7.88E-02	-2.34E-03	ND	0.00E+00	2.63E-09	0.00E+00	4.90E-08	0.00E+00
WDP*	m ³	4.14E+01	2.39E+00	2.21E-03	ND	0.00E+00	8.83E-06	0.00E+00	1.73E-05	0.00E+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									

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

sAdditional mandatory and voluntary impact category indicators

Results per 1 m ² of coated glass										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	1.14E+01	3.14E-01	9.06E-03	ND	0.00E+00	9.34E-07	0.00E+00	4.34E-06	0.00E+00

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Resource use indicators

Results per 1 m ² of coated glass										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	MJ	7.02E+00	1.11E+00	-1.00E-02	ND	0.00E+00	7.21E-07	0.00E+00	5.21E-06	0.00E+00
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	7.02E+00	1.11E+00	-1.00E-02	ND	0.00E+00	7.21E-07	0.00E+00	5.21E-06	0.00E+00
PENRE	MJ	5.56E+01	4.95E+00	-3.22E-02	ND	0.00E+00	1.27E-05	0.00E+00	5.72E-05	0.00E+00
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	5.56E+01	4.95E+00	-3.22E-02	ND	0.00E+00	1.27E-05	0.00E+00	5.72E-05	0.00E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	5.76E+01	1.46E-02	-3.09E-04	ND	0.00E+00	5.71E-09	0.00E+00	1.03E-07	0.00E+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									

Waste indicators

Results per 1 m ² of coated glass										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	5.10E-07	1.33E-07	6.54E-09	0.00E+00	0.00E+00	9.60E-13	0.00E+00	1.27E-11	0.00E+00
Non-hazardous waste disposed	kg	7.09E-02	6.35E-03	4.82E-02	0.00E+00	0.00E+00	1.80E-09	0.00E+00	1.60E-04	0.00E+00
Radioactive waste disposed	kg	2.16E-02	4.94E-04	-1.60E-05	0.00E+00	0.00E+00	1.82E-11	0.00E+00	4.99E-10	0.00E+00

Output flow indicators

Results per 1 m ² of coated glass										
Indicator	Unit	A1-A3	A4	A5	B1-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	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	1.39E-02	0.00E+00	0.00E+00	0.00E+00	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	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

References

General Programme Instructions of the International EPD® System. Version 4.0.
PCR 2019:14. Construction products. 1.3.4
c-PCR Flat glass products used in buildings and other construction works

