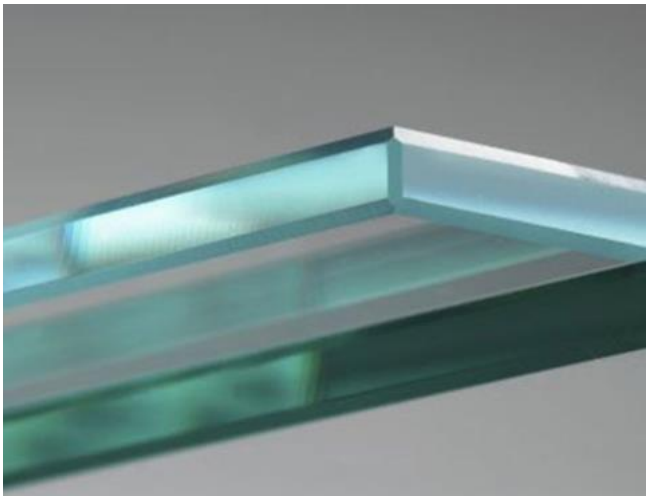
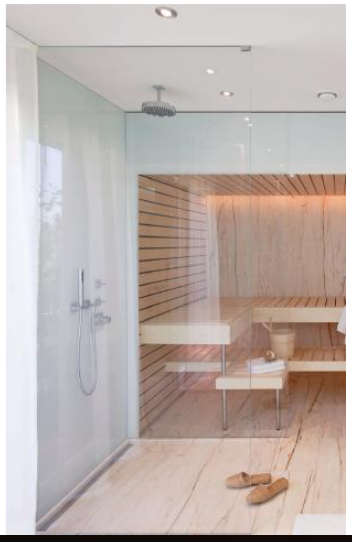
Environmental Product Declaration No 50/2016

DURACLEAR® functional glass produced by EUROGLAS in Ujazd POLAND



Issuance date: 01.02.2016
Validity date: 01.02.2021



EPD program operator:

Building Research Institute (ITB), 00-611 Warsaw, Filtrowa 1
www.itb.pl; www.zb.itb.pl/epd
ITB is the member of The European Platform for EPD program operators. www.eco-platform.org

Manufacturer

Euroglas Polska Sp. Z o.o.
Office and factory: Osiedle Niewiadów 65, 97-225 Ujazd, POLAND
Telephone number: +48 44 719 40 00
Fax number: +48 44 719 49 99
Internet address www.euroglas.com
E-mail address: ujazd@euroglas.com

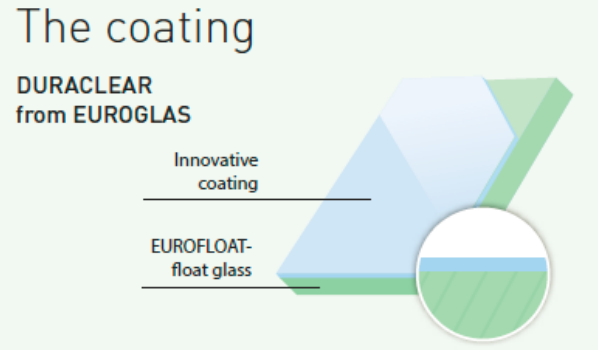
Basic information

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025 by external auditor. It contains the information on the impacts of declared construction materials on environment and their aspects verified by the independent Advisory Body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).
Life cycle: A1-A3 modules in accordance with EN 15804 (Cradle to Gate)
The year of preparing the characteristic: 2015
Declared durability: Under normal conditions, Euroglas products are expected to last the service life of a building (60 years)
PCR: ITB PCR A (PCR based on EN 15804)
Declared unit: 1 m^2 with 4 mm thickness of functional glass.
Reasons for performing LCA: B2B
Representativeness: Polish product

Manufacturer and Product Information

DURACLEAR glass, made in Ujazd factory, is a functional glass made of EUROFLOAT flat glass with special coating. A coating beware of condensation on the outside and helps to prevent persistent dirt. Vacuum magnetron sputtering technology is used for the innovative DURACLEAR coating: the protective coating permanently bonds with the EUROFLOAT base glass and ensures a consistently smooth surface, outstanding durability and resistance to body care products and cleaning agents. No further preparation is required to finish the glass..

DURACLEAR from EUROGLAS is simple to clean and remains lastingly attractive. Thanks to its unique coating, DURACLEAR from EUROGLAS is resistant to corrosion and offers reliable protection from the harmful effects of humidity, heat, shampoo and synthetic detergents. The coating can be applied to any base float glass; float glass (EUROFLOAT) and extra clear glass (EUROWHITE NG). It affect the photometric properties of the base glass slightly.



The benefits of DURACLEAR:

- Corrosion-resistant
- Easy to groom
- Resistant to cleaning agents and body care products
- Highly effective glass sealg
- Permanent shine and brilliance
- Robust
- Long-term consistent
- Colour-neutral

Other applications

Everywhere glass is permanently exposed to humidity, humidity corrosion can arise. DURACLEAR is the solution for long lasting glass brilliance in various uses, for example:

- sauna glazing
- glazing of indoor swimming pools
- glass awnings
- glass balustrades and railings
- terrace roofing

The subject of this EPD is based on the actual technical documents for factory Ujazd of Euroglas Sp. z o.o. in Poland. All actual technical documents are always available on website www.euroglas.com

Set of products for Euroglas under this EPD covers DURACLEAR glass shown in Table 1

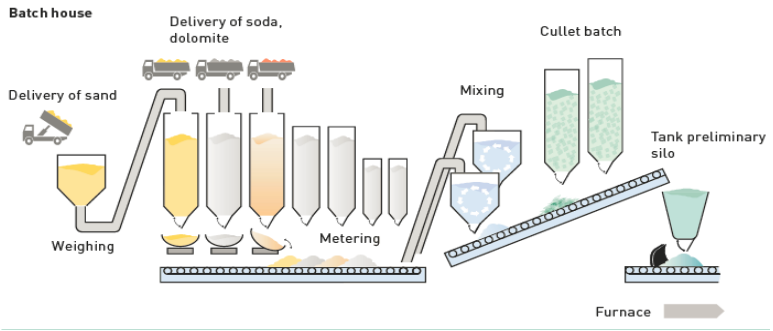
Table 1. Product description and range

PRODUCT	TYPE	STANDARD
DURACLEAR glass	EUROFLOAT glass with special coating	EN 572, EN 1096, EN 12543, EN 12150, EN 1863, EN 14179

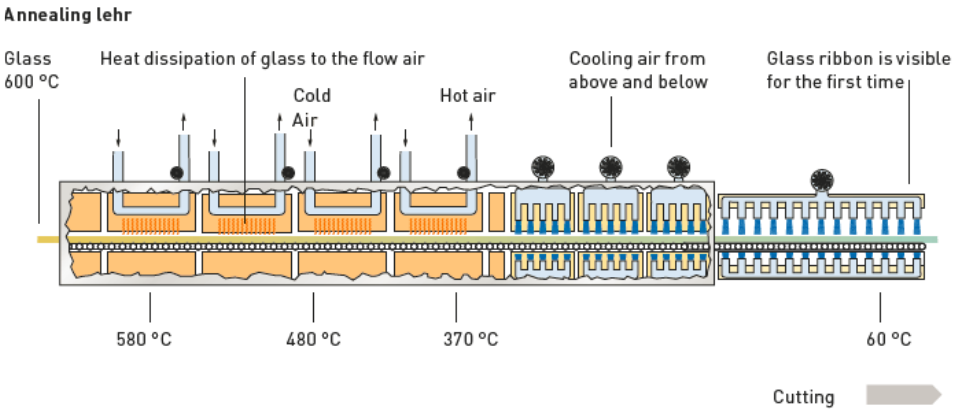
A1 and A2 Modules: Raw materials supply and transport

Raw materials for flat glass production come from local (Polish) suppliers from Poland, Data on transport of the different products to the manufacturing plant are collected and modelled for Ujazd plant by ITB. Means of transport include truck, train and ship, and Polish and European fuel averages are applied.

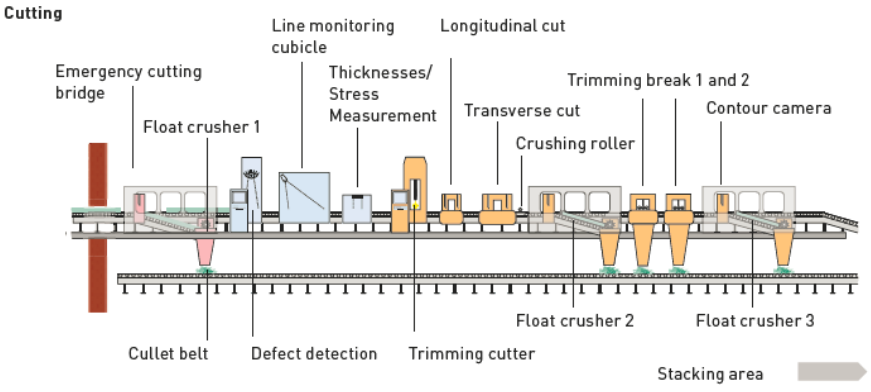
A3: Production



The most important base material in the manufacture of float glass is quartz sand, a material that is in plentiful supply in nature and will also be available to future generations in sufficient quantity. It also needs soda, dolomite, lime and other raw materials in smaller quantities. Approximately 20 % clean cullet is added to the mixture to improve the melting process. These raw materials enter the melting furnace as a batch, where they are melted at a temperature of approx. 1550 °C and refined with minimal bubbles. The liquid glass is then fed to the float bath, which contains a tin melt in a protective inert-gas atmosphere. The glass mass "floats" on the molten tin in the form of an endless ribbon. The surface tension of the glass and the flat surface of the tin bath cause a plane-parallel and distortion-free glass ribbon of high optical quality to form. In the cooling tunnel and on the subsequent open roller conveyor, the glass ribbon is continuously cooled down from 600 to 60 °C, monitored by camera technology for defects, and then cut into glass sheets of predominantly 3210 x 6000 mm in size.



Manufacture covers all processes linked to production, which comprises various related operations besides on-site activities, including float glass production process, application of protective coating, finishing, packaging and internal transportation. The manufacturing process also yields data on the combustion of refinery products, such as diesel and gasoline, related to the production process. Use of electricity, fuels and auxiliary materials in the production of float glass is taken into account using national data. The environmental profile of these energy carriers is modelled by ITB for average Polish conditions. Packaging-related flows in the production process and all upstream packaging are included in the manufacturing module. Apart from production of packaging material, the supply and transport of packaging material are also considered in the LCA model. In accordance with EN 15804, they are reported and allocated to the modules where the packaging is applied in EPD-ITB no1 and no2. Data on packaging waste



created during this step are then generated. It is assumed that packaging waste generated in the course of production and up-stream processes is 100% collected and incinerated based on a multi-input and multi-output process specific to the elementary composition of the waste. Energy (e.g. electricity) are credited using national production averages.

Allocation

The allocation rules used for this EPD are based on ITB-PCR A. The flat glass (with coating becomes DURACLEAR) system production is a single line process without co-products All impacts from raw materials extraction are allocated in A1 module of EPD. 100% of impacts from line production were inventoried and allocated to DURACLEAR glass production which generates 40% of all factory impacts in module A3. Municipal waste and waste water of whole factory were allocated to module A3. Electricity was inventoried for whole production process. Emissions are measured separately as well and presented in A3 module.

System limits

The life cycle analysis of the examined products covers “Product Stage”, A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB-PCR A. Details on systems limits are provided in product specific ITB-EPDs. For example for EUROGLAS flat glass with special coating system includes extraction of raw materials outside of factory in Ujazd (upstream process), transport to the factory and production stage in Ujazd. All materials and energy consumption inventoried in factory were included in calculation. Office impacts were also taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilised thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. This study also takes into account some material flows of less than 1% and energy flows with a proportion of less than 1 energy-%,. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

Data collection period

The data for manufacture of the examined products (flat gass) refer to the year 2015. The life cycle assessments were prepared for Poland as the reference area.

Data quality, assumptions and estimates

The values determined to calculate the LCIA originate from verified LCI EUROGLAS Ujazd inventory data. This data was verified by ISO auditor and was presented for external auditor. Impacts for each product and factory process were inventoried and calculated separately. All raw material consumption, emission water used were specific and presented in specific EPD. Emission into air from energy carriers was estimated using formal conversion factors for carriers.

Databases

The data for LCA are calculated or comes from specific EPD for flat glass (ITB EPD No 49/2016) , PGE (Electricity). Specific data quality analysis was a part of external ISO audit. Characterization factors are CML ver. 4.2 based on EN 15804:2013+A1 version. (PN EN 15804+A1:2014-04)

Calculation rules

LCA was done in accordance to PCR A document.

Power Mix

Selection of the power mix for 2012-2014 in accordance with formal National Mix published by annual GUS report. Specific data for power production impact - PGE

Note

Specific information on application and other actions with these system products are described in detail in the technical data sheet available on the producers website.

Environmental characteristics (LCA)

Table 2. Environmental characteristic for DURACLEAR glass (1 m², 4 mm thickness)

Environmental assessment information (MNA – Module not assessed, MD – Module Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

Environmental impacts: (1 m², 4 mm thickness)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	2,53	7,31	3,99	13,83
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	4,55E-08	1,59E-06	2,73E-08	1,66E-06
Acidification potential of soil and water	[kg SO_2 eq.]	3,49E-02	8,95E-02	5,82E-03	1,30E-01
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	2,32E-03	2,78E-03	0,00E+00	5,10E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	5,77E-03	1,55E-02	4,55E-06	2,12E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4,09E-04	0,0	1,28E-04	5,36E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	36,76	2,52	73,51	112,79
Environmental aspects on resource use: (1 m², 4 mm thickness)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	2,06E-01	0,0	6,68E-04	2,07E-01
Use of renewable primary energy resources used as raw materials	[MJ]	2,74E-01	8,00E-02	2,75	3,11
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4,81E-01	8,00E-02	2,75	3,31
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	28,56	3,87	109,34	141,78
Use of non-renewable primary energy resources used as raw materials	[MJ]	3,62E-05	0,0	2,00E-03	2,04E-03
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	28,56	3,87	109,35	141,78
Use of secondary material	[kg]	2,67E-04	0,0	4,70	4,70
Use of renewable secondary fuels	[MJ]	6,39E-08	0,0	0,0	6,39E-08
Use of non-renewable secondary fuels	[MJ]	2,42E-04	0,0	0,0	2,42E-04
Net use of fresh water	[dm^3]	4,00	0,01	2,14	6,15
Other environmental information describing waste categories: (1 m², 4 mm thickness)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	1,38E-05	0,0	2,87E-04	3,01E-04
Non-hazardous waste disposed	[kg]	2,81E-02	0,0	5,58E-01	5,86E-01
Radioactive waste disposed	[kg]	1,96E-08	0,0	2,56E-03	2,56E-03
Components for re-use	[kg]	0,0	0,0	7,71E-03	7,71E-03
Materials for recycling	[kg]	0,0	0,0	1,05E-03	1,05E-03
Materials for energy recovery	[kg]	0,0	0,0	1,96E-04	1,96E-04
Exported energy	[MJ]	0,0	0,0	0,0	0,0

Verification

The process of verification of this EPD is in accordance with EN ISO 14025, clause 8 and ISO 21930, clause 9. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 & 8.3.1. ☒ external ☐ internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: M.Sc. Eng. Dominik Bekierski, d.bekierski@itb.pl Verification of LCA: PhD Eng. Michał Piasecki, m.piasecki@itb.pl

Normative references

- ITB PCR A- General Product Category Rules for Construction Products
- ISO 14025:2006, Environmental management – Type III environmental declarations – Principles and procedure
- ISO 21930:2007, Sustainability in building and construction – Environmental declaration of building products
- ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2000, Buildings and constructed assets — Service life planning — Part 1: General principles
- ISO 15686-8:2008, Buildings and constructed assets – Service life planning – Part 8: Reference service life
- EN 15804:2012+A1:2013, Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
- EN15942:2011, Sustainability of construction- Environmental product declarations. Communication format business-to-business

Building Research Institute
00-611 Warszawa, ul. Filtrowa 1

Instytut Techniki Budowlanej

00-611 Warszawa, ul. Filtrowa 1

Zakład Fizyki Cieplnej, Instalacji Sanitarnych i Środowiska

02-656 Warszawa, ul. Ksawerów 21

ŚWIADECTWO nr 050/2016
DEKLARACJI ŚRODOWISKOWEJ III TYPU

Wyroby:

Szkło funkcjonalne DURACLEAR

Wnioskodawca:

Euroglas Polska Sp. z o.o.

97-225 Ujazd, Osiedle Niewiadów 65

potwierdza się poprawność ustalenia danych uwzględnionych przy opracowaniu Deklaracji Środowiskowej III typu oraz zgodność z wymaganiami normy

PN-EN 15804+A1:2014-04

Zrównoważoność obiektów budowlanych.
Deklaracje środowiskowe wyrobów.
Podstawowe zasady kategoryzacji wyrobów budowlanych.

Niniejsze świadectwo, wydane po raz pierwszy 1 lutego 2016 r. jest ważne 5 lat, lub do czasu zmiany wymienionej Deklaracji Środowiskowej

Kierownik
Zakładu Fizyki Cieplnej,
Instalacji Sanitarnych i Środowiska
dr inż. Michał Piasecki

INSTYTUT TECHNIKI BUDOWLANEJ

Zastępca Dyrektora
ds. Badań i Innowacji
dr inż. Krzysztof Kuczyński

Warszawa, luty 2016 r.