
ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025 and EN 15804

Writeable Magnetic Glass Panels

Squiggle Glass Limited



EPD registration number S-P-01082

Issued on 4 October 2017; valid to 3 October 2022



The environmental impacts of this product have been assessed from cradle to installation
This Environmental Product Declaration has been verified by an independent third party

INTRODUCTION

Squiggle Glass Limited is a specialist manufacturer of writeable magnetic glass panels, based in Southend-on-Sea, UK.

This EPD provides environmental performance indicators for all Squiggle Glass' writeable magnetic glass panels.

This is a cradle-to-gate with options EPD in accordance with the requirements of EN 15804. It covers modules A1 - A3, A4 and A5 as defined in that standard.

The EPD is based on a life cycle assessment (LCA) study which used production data for the 12-month period 1st July 2016 - 30th June 2017 from Squiggle Glass Limited's manufacturing facility in Southend-on-Sea, UK, and from facilities carrying out steel and glass coating. Background data were taken from the ecoinvent database (v3.3).

The EPD presents details of the LCA, a description of the product life cycle it covers, values for the environmental indicators specified by EN 15804 and a brief explanation of those results.

The declared unit is 1 square metre of panel (1m²)

WRITEABLE MAGNETIC GLASS PANELS	
EPD programme:	The International EPD® System
EPD programme operator:	EPD International AB - Stockholm - Sweden www.environdec.com
EPD owner:	Squiggle Glass Limited Squiggle Works, 7-9 Laurence Ind Park, Eastwoodbury Lane Southend-on-Sea, SS2 6RH - UK http://squiggleglass.com
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PCR review conducted by:	The Technical Committee of the International EPD® System Chair: Filippo Sessa ; contact via info@environdec.com
EPD verification:	Independent verification of this EPD and data, according to ISO 14025/2006: <input type="checkbox"/> internal certification <input checked="" type="checkbox"/> external verification
Third party verifier:	Ugo Pretato - Recognised Individual Verifier
Accredited or approved by:	The International EPD® System
LCA conducted by:	EuGeos Limited - UK +44 (0)1625 434423 - www.eugeos.co.uk

EPDs within the same product category but from different programmes may not be comparable.
EPDs of construction products may not be comparable if they do not comply with EN 15804.

COMPANY PROFILE

Squiggle Glass Limited designs and produces writeable magnetic glass panels from its manufacturing base in Southend-on-Sea, UK. The factory uses the latest design techniques to ensure high quality products which are rigorously tested both in-house and externally before going to market.

CONTACT

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PRODUCT INFORMATION

WRITEABLE MAGNETIC GLASS PANELS

The Squiggle Glass panel is a magnetic glass panel that offers the user a surface that is easy to write on and easy to clean with a separate magnetic eraser. The product has a frameless construction that allows any vertical surface to be used as a seamless, aesthetically pleasing presentation area. Squiggle Glass panels can be fitted to any flat vertical surface and can be purpose made to fit spaces of any dimensions.



This EPD applies to all Squiggle Glass' writeable magnetic glass panels, whether glued to the wall ("glued-to-wall") or attached with hooks supplied by the company ("hook-on").

All writeable magnetic glass panels produced by Squiggle Glass Limited are classified CPC 3711 under the UN CPC classification system V2.1.

MANUFACTURING

Squiggle Glass' Southend factory carries out the following activities:

- Storage of raw materials and components packaging
- Panel manufacture
- Preparation of finished products for delivery and installation

PACKAGING

Finished panels are prepared for transport to site by fitting them with protective corners. These are removed at installation and returned to the factory for re-use. No other packaging is used.

PRODUCT USE AND MAINTENANCE

The product requires no special maintenance beyond cleaning, which can be carried out with a purpose-made eraser.

Hook-on panels can be easily relocated by the owner. The panel is removed from the supporting brackets and the brackets moved to the new location using basic hand or power tools.

Paint finishes can be selected from most RAL, Dulux or Pantone colours; specific colours are also offered that show projected images to best effect.

END-OF-LIFE

The glass and steel elements can be separated at end-of-life and separately recycled through a regulated recycling scheme

The European Waste Catalogue (EWC) codes below apply to the product or parts of it when removed from the building:

EWC 17 02 02 Glass

EWC 17 04 05 Iron and steel

All hook-on panels are designed to be re-usable and re-locatable if properly configured.

FURTHER PRODUCT INFORMATION

Detailed product information and datasheets can be found on our website:

<http://squiggleglass.com>

CONTENT DECLARATION

The mass of the declared unit (1m² of panel) is 21kg for glue-to-wall panels, 22kg for hook-on panels.

The material compositions of Squiggle Glass' writeable panels are shown below:

Material	% of declared unit (wt.%)	
	Hook-on panels	Glue-to-wall panels
Glass	54-55	56-57
Steel	39	37
Polyurethane	4	4
Polyester; modified polymethyl methacrylate	<1	<1
TiO ₂ +/- organic pigments and additives according to panel colour	1-2	1-2

No substance on the "Candidate List of Substances of Very High Concern for authorisation" derived under REACH is present either above the limits for registration with the European Chemicals Agency or in excess of 0.1 weight-% of the product

Additional materials required for installation of the declared unit in the building (module A4) are as follows:

Material	quantity (kg) per declared unit	
	Hook-on panels	Glue-to-wall panels
Galvanised brackets	0.2kg	n/a
Steel screws	0.1kg	n/a
Adhesive	n/a	0.1kg

TECHNICAL DATA

The technical characteristics of Squiggle Glass' Writeable Magnetic Glass Panels are summarised below.

Name	Value	Unit
Mass for a unit area (glue-to-wall panel)	21	kg/m ²
Mass for a unit area (hook-on panel)	22	kg/m ²
BS EN 12150 Toughened Glass		

RESIDUAL RISKS AND EMERGENCIES

There are no residual risks associated with the normal day to day use of Squiggle Glass panels in the context for which they are designed and specified.

ENVIRONMENTAL PERFORMANCE-RELATED INFORMATION

LCA INFORMATION

This section of the EPD records key features of the LCA on which it is based.

SCOPE

This cradle-to-gate with options EPD covers the production stage, delivery to site and installation in the building (modules A1 - A3, A4, A5 see below); as permitted by EN 15804 modules A1-A3 are declared in aggregated form.

Product stage			Construction process stage		Use stage							End of life stage				Benefits & loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport to the site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste disposal	Disposal	Reuse- recovery- recycling- potential
A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	B 5	B 6	B 7	C 1	C 2	C 3	C 4	D
X	X	X	X	X	M N D	M N D	M N D	M N D	M N D	M N D	M N D	M N D	M N D	M N D	M N D	MND

X: included in LCA; MND: module not declared or NR for not relevant

DECLARED UNIT

The declared unit is 1m² of writeable magnetic glass panel.

SYSTEM BOUNDARIES

This EPD covers the product stage and the construction process stage. It includes the following information modules:

- A1 - raw material extraction and processing, and the processing of secondary material input
- A2 - transport of raw materials and secondary material inputs to the manufacturer
- A3 - manufacturing of the construction product and packaging
- A4 - delivery to site
- A5 - installation in the building

The product stage includes the extraction and manufacture of raw materials, intermediate products and energy, as well as waste processing up to the end-of-waste state (i.e. no longer considered a waste material) or disposal of final residues arising during the product stage.

All upstream resource extraction and manufacturing processes are included in the system. All energy used in factories and offices at Squiggle Glass' Southend-on-Sea site is included.

Modules A1, A2 and A3 are declared as one aggregated module A1 – A3.

The product life cycle covered by this EPD is illustrated below.

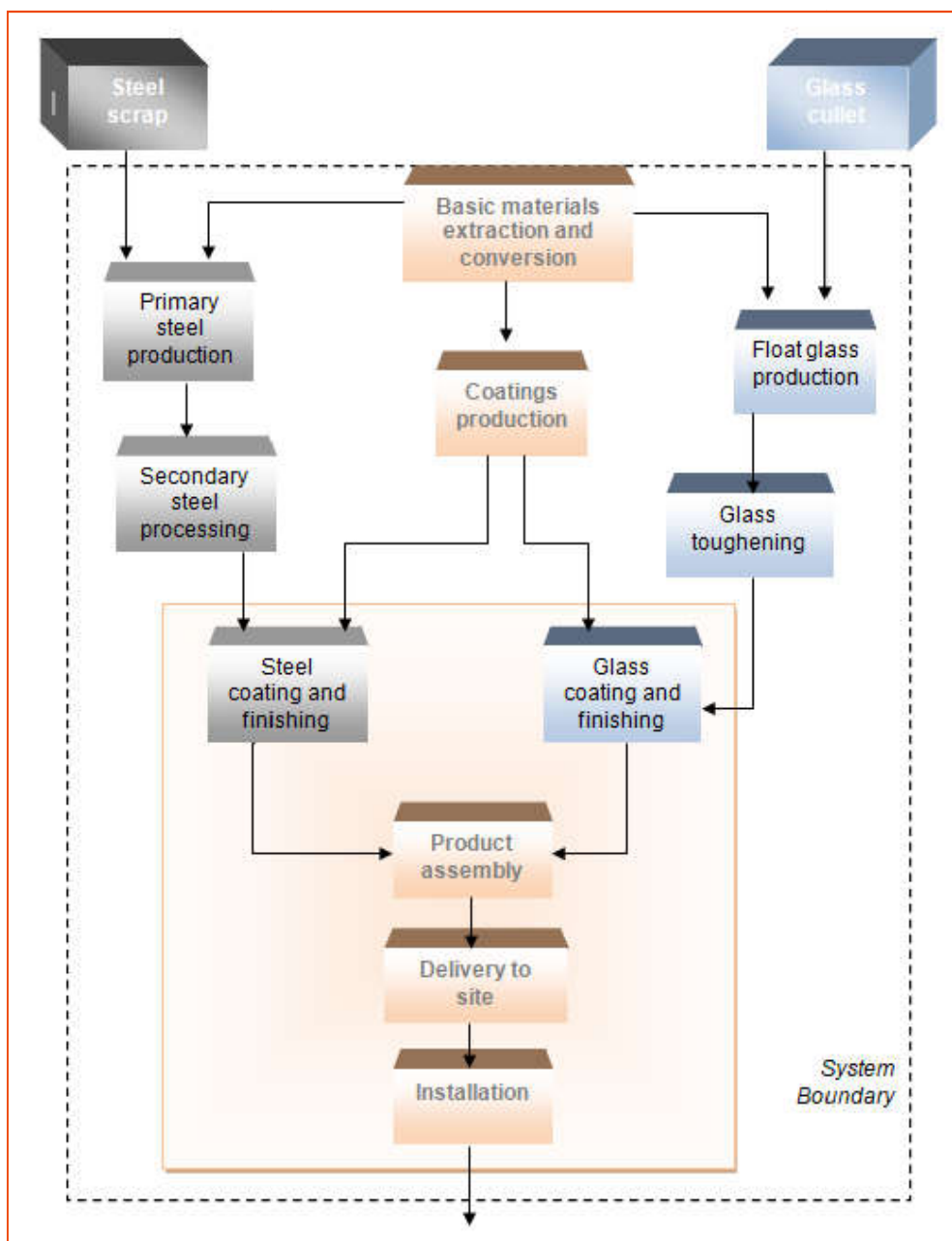


FIGURE 1: SQUIGGLE GLASS LCA SYSTEM BOUNDARIES

Squiggle Glass writeable magnetic glass panels are manufactured from steel and flat glass sheets. Steel sheets are coated with a polyester-based powder coat, and the glass toughened then back-painted using a polyurethane paint, in specialist facilities prior to final assembly of the panels at Squiggle Glass' factory in Southend, UK.

CUT-OFF CRITERIA

Following EN 15804 and the PCR, flows representing $\leq 1\%$ of the total mass of material inputs can be omitted (cut-off) from a core process in the LCA up to a combined maximum of 5% of the total energy and mass inputs for any single module. Inputs whose extraction, use or disposal results in significant environmental effects or energy use, and inputs or outputs classified as hazardous waste must be included in all cases.

The data collected from Squiggle Glass encompassed all raw materials, packaging materials and process aids, as well as transport to the manufacturing site, energy and water use, and direct production waste. There are no emissions to air or water apart from un-monitored combustion gases and trade effluent; these are quantified by virtue of mass balance (trade effluent) or by their inclusion in generic processes characterising inputs (gas combustion). Non-hazardous material inputs amounting, in combination, to $<0.1\%$ of all inputs during the data period were omitted from the LCA.

DATA SOURCES AND DATA QUALITY

Data used for this EPD were collected following guidance in ISO 14044:2006; the most current available data were used in accordance with EN 15804.

Squiggle Glass data used in the LCA cover a period of 1 year from 01 July 2016, representing 1-year averaged data. Primary data was also collected for steel- and glass-coating and glass toughening. All of these data were checked to ensure that the inputs included sufficient materials and water to account for all outputs, including products and wastes. For the coating and toughening processes, missing flows were added by reference to generic process data. The technological coverage of all core process data reflects physical reality for the declared product.

BACKGROUND DATA

Gate-to-gate data for glass production were taken from "Life Cycle Assessment of Float Glass", Glass for Europe, 2011. Other (generic) data sets used for calculations have been updated within the last 10 years.

Background (generic) data for other raw material inputs and fuels were taken from the ecoinvent database v3.3 (2016). Where raw materials are sourced by Squiggle Glass from actual production facilities whose location is known, datasets representing production have been used; where they are sourced from production facilities whose location is not known, market datasets have been used. Data quality has been reviewed for all processes that contribute significantly to the overall LCA and deemed fit for purpose.

ALLOCATION

In the background data, the ecoinvent default allocation is applied to all processes except those in which secondary materials are used, where the "cut-off" allocation is applied. Thus secondary materials are free of upstream burdens that arise prior to their reaching the "end of waste" state, in accordance with Section 6.3.4.2 of EN 15804.

Primary data for facilities producing two or more products have been sub-divided where possible to avoid allocation. Remaining inputs and outputs are allocated on the basis of physical relationships.

ASSUMPTIONS AND ESTIMATES

Inputs to and outputs from the system are accounted for over a 100-year time period; long-term emissions are therefore omitted from the impact assessment step of the LCA.

The "primary energy used as material" indicators (PERM; PENRM) are calculated using published net calorific values for constituent materials which can yield energy on combustion, or from published PERM or PENRM where calorific values are not available. In this EPD, the following values are used:

- renewable primary energy as material: not applicable
- non-renewable primary energy as material: 46 MJ/kg

"Primary energy as fuel" indicators (PENRE, PERE) are calculated as the total primary energy demand minus primary energy used as material.

Delivery of the product to site and installation are characterised using scenarios. The relevant parameters are shown in the tables below:

Scenario Parameters - Transport to site ¹	
Parameter	Quantity and unit
Vehicle type	Van
Vehicle load capacity	approx. 2000 (kg)
Fuel type and consumption	diesel, 0.1 (l/km)
Volume capacity utilisation factor	1
Capacity utilisation (including empty returns)	22%
Distance to site	70 (km)
Bulk density of transported products	3500 kg/m ³

Scenario Parameters - Installation		
Parameter	Quantity and unit	
	hook-on panel	glue-to-wall panel
Materials, Energy & water		
Galvanised brackets	0.2kg	n/a
Steel screws	0.1kg	n/a
Adhesive	n/a	0.1kg
UK low voltage electricity	0.075 kWh	n/a
Water use	n/a	n/a
Waste materials on the building site before waste processing	n/a	0.05kg HDPE packaging
Output materials after waste processing at the building site	n/a	0.05kg municipal waste to landfill
Direct emissions to ambient air, soil and water	n/a	n/a
Vehicle type for waste transport	n/a	municipal waste truck
Fuel type and consumption	n/a	diesel, 4
Vehicle load capacity	n/a	8.2t
Distance to construction site	n/a	1.6l/km
Capacity utilisation (including empty returns)	n/a	50%
Bulk density of transported products	n/a	900 kg.m ⁻³
Volume capacity utilisation factor	1	1

¹ The product is delivered directly to the construction site; distance to a central warehouse is not relevant

LCA RESULTS

ENVIRONMENTAL INDICATORS

Environmental indicator results for the A1 - A3 modules on an aggregated basis, as well as module A4 and module A5, are shown in the 4 following tables for the declared unit of 1m² of panel. Indicators values are provided for both hook-on and glue-to-wall panels; module A4 indicator values are identical for both.

Environmental Impacts	Unit	Modules A1 - A3		Module A4 (transport)	Module A5 (installation)	
		hook-on panel	glue-to-wall panel	panel	hook-on panel	glue-to-wall panel
Global warming potential (GWP)	kg CO ₂ -eq	5.11E+01	4.91E+01	2.69E+00	6.43E-01	9.11E-01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11-eq	5.69E-06	5.55E-06	4.61E-07	4.15E-08	6.15E-09
Acidification potential of land and water (AP)	kg SO ₂ -eq	2.78E-01	2.69E-01	1.02E-02	5.38E-03	4.45E-03
Eutrophication potential (EP)	kg PO ₄ ³⁻ -eq	4.17E-02	3.98E-02	1.79E-03	1.11E-03	5.30E-04
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg ethene-eq	3.13E-01	3.12E-01	1.05E-03	3.20E-04	2.20E-04
Abiotic depletion potential for non-fossil resources (ADPE)	kg Sb-eq	3.80E-04	3.60E-04	1.02E-05	2.30E-04	2.52E-06
Abiotic depletion potential for fossil resources (ADPPF)	MJ	8.60E+02	8.31E+02	3.82E+01	8.86E+00	1.60E+01

Resource Use	Unit	Modules A1 - A3		Module A4 (transport)	Module A5 (installation)	
		hook-on panel	glue-to-wall panel	panel	hook-on panel	glue-to-wall panel
Renewable primary energy as energy carrier (PERE)	MJ	4.88E+01	4.67E+01	6.07E-01	7.01E-01	2.92E-01
Renewable primary energy resources as material utilization (PERM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT)	MJ	4.88E+01	4.67E+01	6.07E-01	7.01E-01	2.92E-01
Non-renewable primary energy as energy carrier (PENRE)	MJ	9.06E+02	8.76E+02	3.92E+01	9.59E+00	1.32E+01
Non-renewable primary energy as material utilization (PENRM)	MJ	4.15E+01	4.15E+01	0.00E+00	0.00E+00	4.05E+00
Total use of non-renewable primary energy resources (PENRT)	MJ	9.48E+02	9.17E+02	3.92E+01	9.59E+00	1.73E+01
Use of secondary material (SM)	kg	4.44E+00	4.11E+00	8.45E-07	1.53E-02	0.00E+00
Use of renewable secondary fuels (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	0.00E+00	0.00E+00	1.09E-02	0.00E+00	1.35E-03
Use of net fresh water (FW)	m ³	6.75E-01	6.50E-01	6.76E-03	7.27E-03	8.21E-03

Waste	Unit	Modules A1 - A3		Module A4 (transport)	Module A5 (installation)	
		hook-on panel	glue-to-wall panel	panel	hook-on panel	glue-to-wall panel
Hazardous waste disposed (HW)	kg	3.50E+00	3.26E+00	2.03E-02	7.84E-02	7.80E-03
Non-hazardous waste disposed (NHW)	kg	8.84E+01	8.30E+01	3.48E+00	1.78E+00	1.34E-01
Radioactive waste disposed (RW)	kg	3.20E-03	3.13E-03	2.70E-04	2.20E-05	3.95E-06

Output Flows	Unit	Modules A1 - A3		Module A4 (transport)	Module A5 (installation)	
		hook-on panel	glue-to-wall panel	panel	hook-on panel	glue-to-wall panel
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.42E+00	1.42E+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
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

INTERPRETATION

For almost all the environmental themes covered, production of glass and steel accounts for the majority of the indicator totals. The contribution of the paint on the glass panel is considerably greater than the proportion of the product that paint represents on a mass basis. For the POCP indicator, organic compounds which are lost from the paint when it dries account for >90% of the indicator total; because of necessary assumptions made in modelling paint production in the LCA, there is higher uncertainty associated with this indicator than with others. No ozone-depleting substances are used in production of Squiggle Glass panels or their constituent elements: the ODP indicator derives from "background" data and should be treated with great caution.

For the delivery-to-site stage (module A4) vehicle operation - in particular fuel consumption - is the dominant driver of all environmental impact indicators impact categories except ODP and ADPE. Indicator values are approximately proportional to the distance travelled. There is a high level of uncertainty in the data underlying the ODP and ADPE indicator values for this stage.

In the case of glued-to-wall panels, environmental impact indicators for the installation stage are associated with adhesive production except for the ODP indicator, which derives from uncertain data associated with transport fuel production.

In the case of hook-on panels, environmental impact indicators for the installation stage derive from production of the brackets and screws used - either the production of steel or, for ADPE, AP, EP, the galvanising process.

REFERENCES

ecoinvent database (v3.3) - www.ecoinvent.ch

EN 15804:2012 + A1:2013 - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products.

General Program Instructions, Version 2.5, 2015-05-11 - The International EPD® System - EPD International AB.

ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

LCA of Writeable Magnetic Glass Panels - Report for Squiggle Glass Limited - EuGeos Limited (2017).

Life Cycle Assessment of Float Glass, Glass for Europe, November 2010, revised February 2011.

PCR 2012:01 Construction products and Construction services, Version 2.2, 2017-05-30 - The International EPD® System - EPD International AB.

GLOSSARY

The International EPD® System: a programme for Type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. (www.environdec.com)

Life cycle assessment (LCA): LCA studies the environmental aspects and quantifies the potential impacts (positive or negative) of a product (or service) throughout its entire life. ISO standards ISO 14040 and ISO 14044 set out conventions for conducting LCA.

REACH Regulation: REACH is the European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals. It entered into force in 2007, replacing the former legislative framework for chemicals in the EU.

SUMMARY

This Environmental Product Declaration provides environmental performance indicators for a writeable magnetic glass panel.

This is an Environmental Product Declaration in accordance with ISO 14025 and EN 15804, and is third-party verified. It is a cradle-to-gate with options EPD in accordance with the requirements of EN 15804, and covers the modules A1 - A3, A4, A5 defined in that standard. Other stages are dependent on the specific application of the product and should be included in a whole-of-life model.

This EPD is based on a life cycle assessment (LCA) study which used production data covering one year, beginning 1st July 2016, from Squiggle Glass Limited's manufacturing facility in Southend-on-Sea, UK. Background data were taken from the ecoinvent database (v3.3).

The declared unit is 1 square metre of panel (1m²).

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