

TEST REPORT

Lucideon Reference: UK224698 (QT-69530/2/AS)/Ref. 3

Project Title: Testing of SWR Glass Adaptor Balustrade System Incorporating 21.5 mm EVA Glass in Accordance with BS 6180:2011 Barriers In and About Buildings

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Work Location: Lucideon UK



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1 INTRODUCTION

Lucideon Limited was commissioned by the client SWR Ltd to carry out line load testing in accordance with BS 6180:2011 Barriers In and About Buildings, to allow their balustrade system to be classified for use in accordance with the Code of Practice included within the Standard.

The testing was carried out at Lucideon's facilities at Queens Road, Penkhull, Stoke-on-Trent on 15 February 2023.

This report summarises the test results obtained during the test programme and does not provide interpretation of those results.

2 TEST SAMPLES

A single system was tested designated as follows:

- SWR Glass Adaptors Fascia Mounted into Concrete.

The system and glass were installed by SWR Personnel.

3 TEST PROGRAMME

A horizontal line load was applied to the systems using the following glazed sections:

- 21.5 EVA Toughened Glass 1200 mm x 1490 mm (w x h).

4 TEST PREPARATION

The SWR Adaptors were bolted to the side of a concrete block having specification C25/30. The concrete block was fixed to the floor of the test facility using M32 bolts.

The system consisted of four 52 mm diameter adaptors which were positioned 100 mm in from the edge of the glass with the first adaptors 200 mm below the finished level of the floor. The adaptors were fixed at 130 mm vertical centres and 1000 mm horizontal centres.

The adaptors were chemically fixed to the concrete block using Fischer Mortar and M10 bars.

The glass, having a width of 1200 mm, was installed and held in position through pre-drilled holes in the glass using the SWR glass adaptors.

Drawings showing the system can be found in Appendix A.

5 TEST METHOD

A horizontal imposed line load was applied to the glass of the fascia-mounted system at a height of 1100 mm above the datum level of the floor with deflections measured at the

same height. The deflections were recorded at the horizontal mid-span of the panel. The load was applied via a hydraulic ram; measured using a calibrated load cell and deflection was measured using a Linear Voltage Displacement Transducer (LVDT). Data was recorded using a calibrated Data Logger.

6 TEST REQUIREMENTS

The tests were carried out in accordance with the guidance given in BS 6180:2011 Barriers In and About Buildings – Code of Practice.

The Standard states that the maximum allowable deflection for a freestanding glass protective barrier panel, when loaded at a minimum height of 1100 mm, is 25 mm. Testing at a height above this is seen as a more onerous test than one which is conducted at 1100 mm.

Table 2 gives the minimum required horizontal imposed loads, depending on the type of building occupancy or structure, in accordance with BS 6180:2011 and an indication as to whether the tested system has achieved the required load.

7 RESULTS

The loads achieved by the balustrade system when tested under line load are given in Table 1. All figures quoted in the Table contain no safety factors, and are direct loads as achieved by the system under test conditions.

TABLES

Table 1 - Working Load Deflections for SWR Adaptor System Facia Mounted into Concrete Tested in Accordance with BS 6180:2011

Balustrade System	Glass	Load Application/Transducer Position (mm)	Imposed Line Load at 25 mm Deflection (kN/m)	Working Line Load for System (kN/m)	Deflection at Working Line Load for System (mm)
SWR Glass Adaptor System	21.5 mm Laminated Toughened EVA	1100/1100	0.74	0.74	24.95

Table 2 - Summary of Suitability for SWR Adaptor System Facia Mounted into Concrete Tested in Accordance with BS 6180:2011

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	21.5 mm EVA Glass
Domestic and residential activities	(i) all areas within or serving exclusively one single family dwelling, including stairs, landings, etc. but excluding external balconies and edges of roofs	0.36	√
	(ii) other residential, i.e. houses of multiple occupancy and balconies, including Juliette balconies and edges of roofs in single family dwellings	0.74	√
Offices and work areas not included elsewhere, including storage areas	(iii) light access stairs and gangways not more than 600 mm wide	0.22	√
	(iv) light pedestrian traffic routes in industrial and storage buildings, except designated escape routes	0.36	√
	(v) areas not susceptible to overcrowding in office and institutional buildings, also industrial and storage buildings, except as given above	0.74	√
Areas where people might congregate	(vi) areas having fixed seating within 530 mm of the barrier, balustrade or parapet	1.50	X
Areas with tables or fixed seating	(vii) restaurants and bars	1.50	X
Areas without obstacles for moving people and not susceptible to overcrowding	(viii) stairs, landings corridors ramps	0.74	√
	(ix) external balconies, including Juliette balconies and edges of roofs, footways and pavements within building cartilage adjacent to basement/sunken areas	0.74	√
Areas susceptible to overcrowding	(x) footways or pavements less than 3 m wide adjacent to sunken areas	1.50	X
	(xi) theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studios; footways or pavements greater than 3 m wide adjacent to sunken areas	3.00	X
	(xii) grandstands and stadia	(Note 1)	X

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	21.5 mm EVA Glass
Retail areas	(xiii) all retail areas, including public areas of banks/building societies or betting shops	1.50	X
Vehicular	(xiv) pedestrian areas in car parks, including stairs, landings, ramps, edges of internal floors, footways, edges of roofs	1.50 (Note 2)	-
	(xv) horizontal loads imposed by vehicles	3.00 (Note 2)	-

Note 1 – See requirements of the appropriate certifying authority.

Note 2 – Clause 8.1.1 of BS 6180:2011 states that “glass should not be used for vehicle protection barriers”.

NOTE: The results given in this report apply only to the samples that have been tested.

END OF REPORT

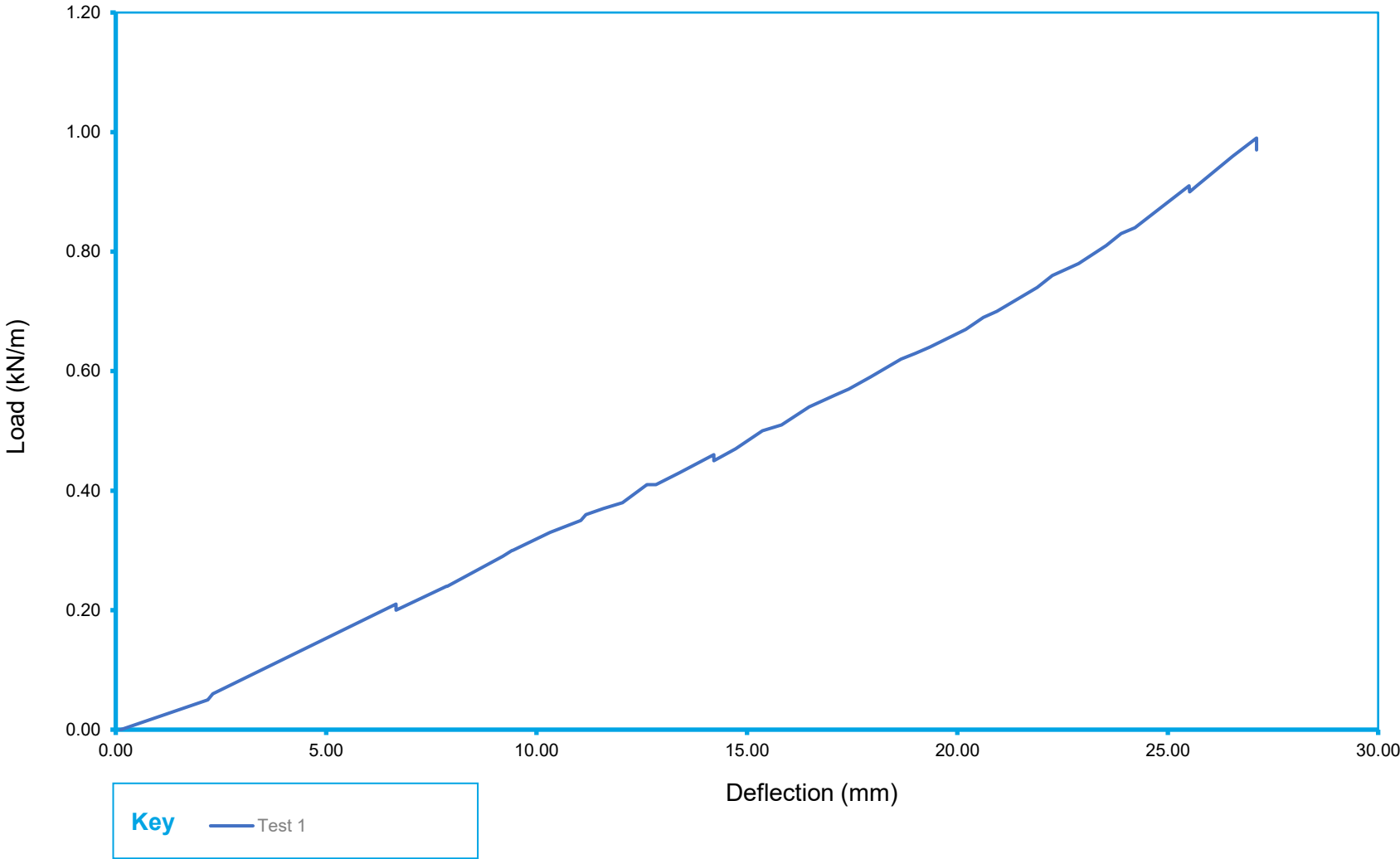
PLATE



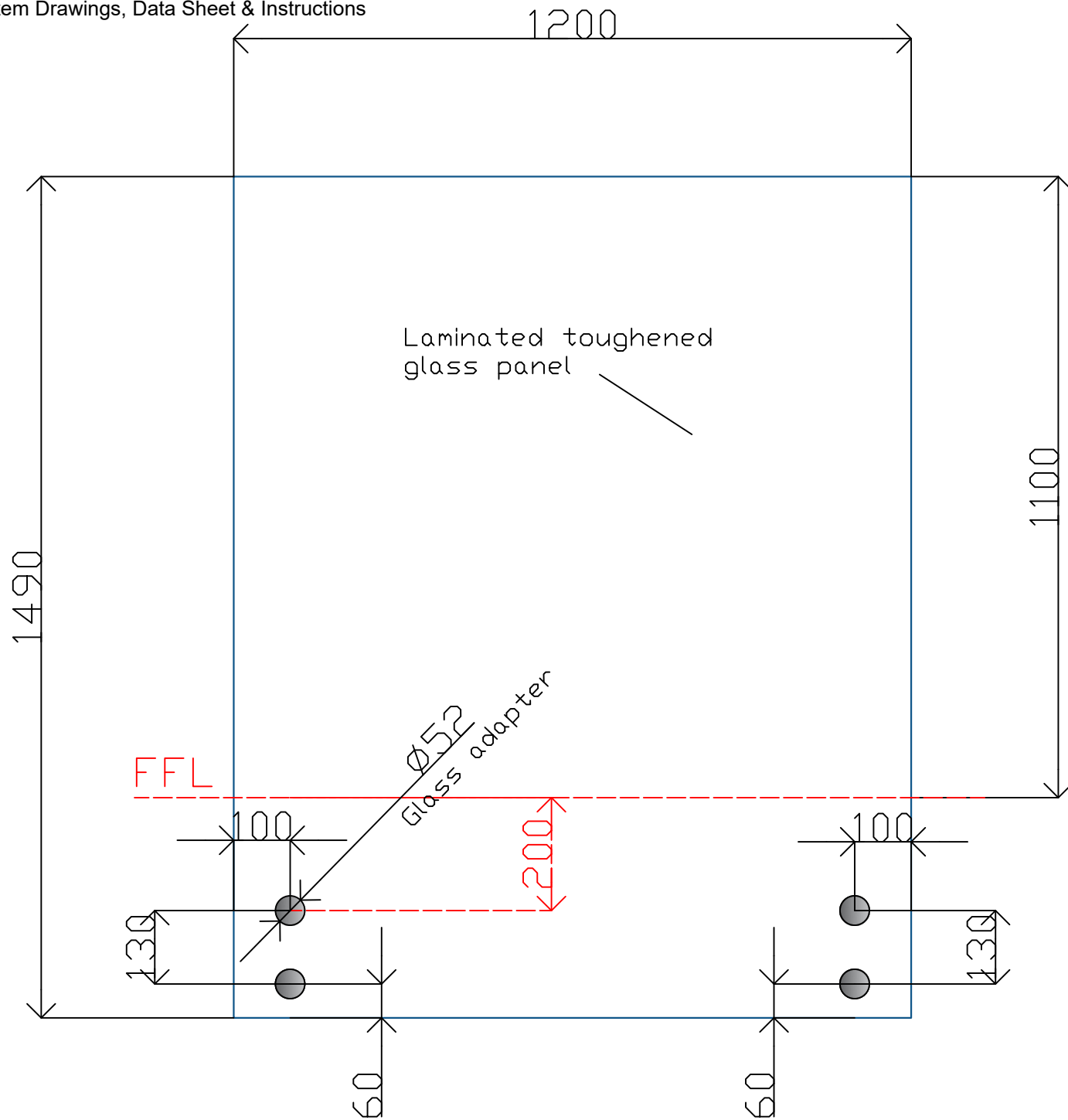
Plate 1 - Typical Specimen Configuration Facia Mount

Chart 1 - Load Deflection Curve for Horizontal Line Load Imposed on SWR Glass Adaptor System Facia Mounted into Concrete Incorporating 21.5 mm Laminated Toughened EVA Glass

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APPENDIX A - System Drawings, Data Sheet & Instructions



Product Sheet

Description:

52mm Diameter AISI316 Glass Adapter for 10-20mm Glass with two screws

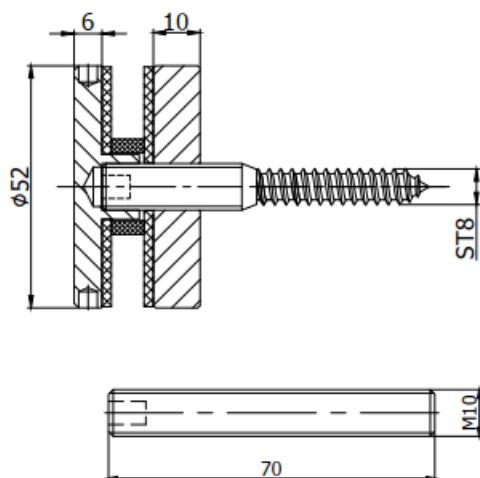
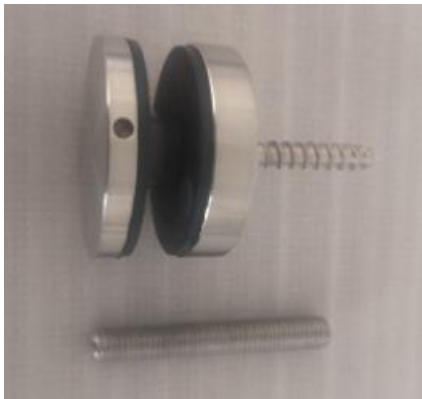
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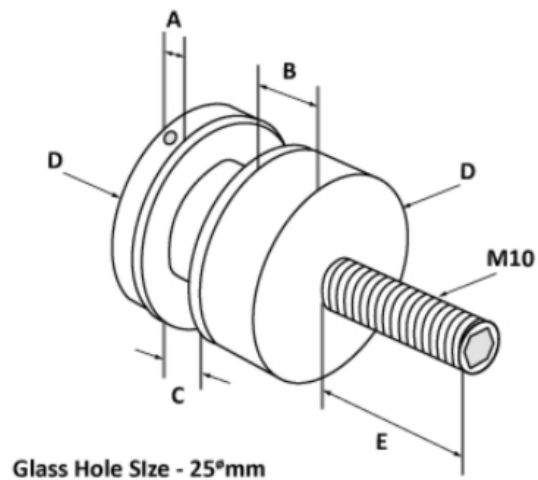
6000.22.010 (SWR)

A4.G6021.00 (Highyear)

Package:

4 pcs per white inner box, 24 pcs per outer box





Dimensions

Fixing Type	A (mm)	B (mm)	C (mm)	D (mmØ)	E (Max mm)	Part Code
Metric & Wood Thread Included	6	10	10-20	52	24	6000.22.010
Metric & Wood Thread Included	6	10	8-20	45	46	6000.22.020

The Hole in the Wall

Timber Thread - Thread can be drilled straight into substrate

Metric Thread - A hole needs to be pre-drilled, emptied and filled with anchor resin before fitting the thread in place. Anchor resin needs to set before installing system. Look at your resin instructions for guidance.

To install the Glass Adaptor

1. Fix the thread into substrate as described above
2. Attach the standoff section (the larger of the two metal pieces) to the thread and push as close to the substrate as possible
3. Place glass onto thread, with the thread fixing through the 25mm hole
4. Finally screw on the face of the Glass Adaptor to firmly secure the glass

Template for Glass

