

TEST REPORT

Lucideon Reference: N254792 (QT-80029/2/KNA)/Ref. 6

Project Title: Testing of Pure Vista Posi-Lite Balustrade System Base Mounted into Steel in Accordance with BS 6180:2011 Barriers In and About Buildings

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1 INTRODUCTION

Lucideon Limited were commissioned by the client Pure Vista to carry out horizontal line load and uniformly distributed 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 20 May 2025.

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:

- Posi-Lite

The system had been designed and intended to be used as a base mounted system for free standing balustrades. The systems and glass were installed by Lucideon personnel.

Technical drawings for the system can be found in Appendix A.

3 TEST PROGRAMME

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

- Posi-Lite steel mounted:
 - 12 mm Mono Glass
 - 13.5 mm PVB Glass
 - 17.5 mm PVB Glass
 - 21.5 mm PVB Glass

A uniformly distributed load was applied to the systems using the following glazed section:

- Posi-Lite steel mounted:
 - 21.5 mm PVB Glass

4 TEST EQUIPMENT

- 5 kN Load Cell Reference FOR023
- Linear Displacement Voltage Transducer Reference TDR026
- 15 tonne Capacity Hydraulic Ram
- DasyLab Data Logger DAQ 0029

5 TEST PREPARATION

For the loading tests, the Posi-Lite system was installed to manufacturer's specifications.

The system was bolted to the top of a piece of reinforced steel C-Section, measuring 1500 mm x 90 mm x 5 mm. The section was welded to a steel anvil, which in turn was bolted to the floor of the test facility.

The system consisted of a single channel which was bolted to the top of the reinforced steel C-Section using 5 No. M12 bolts inserted 100 mm from the edge of the channel and 200 mm thereafter.

The glass, having a width of 1 m, was installed and held in position using a glass clamp and fitting bar system.

The sample for each test was assembled onto the substrate by Lucideon personnel.

A rigid steel frame was assembled and bolted to the laboratory strong floor adjacent to the system. The hydraulic ram was secured horizontally onto this steel frame at the height of the required line load and connected to a hydraulic pump. The load cell was fitted in-line with the ram and connected to the data logger. A rigid steel pole, mounted in a stand, was placed on the strong floor opposite to the loading equipment, and the linear transducer was affixed to it and connected to the data logger.

6 TEST METHOD

6.1 Horizontal Line Load Testing (HLL)

A HLL was applied to the balustrade using a hydraulic ram and a timber spreader beam. The load was positioned at a height of 1100 mm from the base of the profile. To monitor deflection, a Linear Voltage Displacement Transducer (LVDT) was attached to the centre of the glass panel at a height of 1100 mm.

The exception to this is when 21.5 mm PVB glass was used and the load was applied at a height of 1200 mm above the finished floor level with deflection also recorded at a height of 1200 mm.

Both the applied force (via a calibrated load cell) and the resulting deflection were captured in real-time using a DasyLab Data Logger.

Testing continued until either the sample failed or the deflection reached a maximum threshold of 25 mm. (See Plate 1 for the test configuration).

6.2 Uniformly Distributed Load (UDL) Testing

A UDL was applied using a hydraulic ram acting against a 900 mm x 900 mm x 18 mm reaction board. This board ensured the force was spread evenly across the glass panel.

Both the applied force (via a calibrated load cell) and the resulting deflection were captured in real-time using a DasyLab Data Logger.

Testing continued until either the sample failed or the deflection reached a maximum threshold of 25 mm.

7 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. Section 6.4.1 of the Standard states that the maximum allowable deflection of barriers for the protection of people should not exceed 25 mm at any point on the barrier when tested at a height of 1100 mm above the finished floor level for the required design load. Testing at a height greater than this is considered to be more onerous.

Tables 3 and 4 give the minimum required horizontal imposed loads depending on type of building occupancy or structure in accordance with BS 6180:2011.

8 RESULTS

The loads achieved by the Pure Vista Posi-Lite system tested under horizontal line load and uniformly distributed load are given in Tables 1 and 2. All figures quoted in the Tables contain no safety factors and are direct loads as achieved by the system under test conditions.

TABLES**Table 1** – Loads Achieved by Pure Vista Posi-Lite Balustrade System Base Mounted into Steel

System	Fix	Glass	Load Application (mm)	Imposed Line Load at 25 mm (kN/m)	Working Line Load for System (kN/m)	Deflection at Working Line Load (mm)
Posi-Lite	Steel	12 mm Mono	1100	0.41	0.36	23.88
	Steel	13.5 mm PVB	1100	0.43	0.36	22.96
	Steel	17.5 mm PVB	1100	0.83	0.74	22.31
	Steel	21.5 mm PVB	1200	1.1	0.74	16.40

Table 2– Loads Achieved by Pure Vista Posi-Lite Balustrade System Base Mounted into Steel when Subjected to a Uniformly Distributed Load

System	Fix	Glass	Imposed UDL at 25 mm Deflection (kN/m ²)	Working UDL for System (kN/m ²)	Deflection at Working UDL for System (mm)
Posi-Lite	Steel	21.5 mm PVB	1.29	1.0	14.49

Table 3 – Summary of Suitability for Use of Pure Vista Posi-Lite Balustrade System Base Mounted into Steel in Accordance with Table 2 of BS 6180:2011

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Steel			
			12 mm Mono Glass @1100 mm	13.5 mm PVB Glass @1100 mm	17.5 mm PVB Glass @1100 mm	21.5 mm PVB Glass @1200 mm
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	X	X	✓	✓
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	X	X	✓	✓
Areas where people might congregate	(vi) areas having fixed seating within 530 mm of the barrier, balustrade or parapet	1.50	X	X	X	X
Areas with tables or fixed seating	(vii) restaurants and bars	1.50	X	X	X	X
Areas without obstacles for moving people and not susceptible to overcrowding	(viii) stairs, landings corridors ramps	0.74	X	X	✓	✓
	(ix) external balconies, including Juliette balconies, edges of roofs, footways, pavements within building cartilage adjacent to basement/sunken areas	0.74	X	X	✓	✓
Areas susceptible to overcrowding	(x) footways or pavements less than 3 m wide adjacent to sunken areas	1.50	X	X	X	X

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Steel			
			12 mm Mono Glass @1100 mm	13.5 mm PVB Glass @1100 mm	17.5 mm PVB Glass @1100 mm	21.5 mm PVB Glass @1200 mm
	(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	X	X	X
	(xii) grandstands and stadia	(Note 1)	-	-	-	-
Retail areas	(xiii) all retail areas, including public areas of banks/building societies or betting shops	1.50	X	X	X	X
Vehicular	(xiv) pedestrian areas in car parks, including stairs, landings, ramps, edges of internal floors, footways, edges of roofs	1.50 (Note 2)	X	X	X	x
	(xv) horizontal loads imposed by vehicles	3.0 (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”.

Table 4 – Summary of Suitability of Pure Vista Posi-Lite Balustrade System Base Mounted into Steel Tested Under Uniformly Distributed Load in Accordance with Table 2 of BS 6180:2011

Type of Occupancy for Part of the Building	Examples of Specific Use	Uniformly Distributed Load Applied to the Infill (kN/m ²)	21.5 mm PVB 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	0.5	✓
	(ii) other residential, i.e. houses of multiple occupancy and balconies, including Juliette balconies and edges of roofs in single-family dwellings	1.0	✓
Offices and work areas not included elsewhere, including storage areas	(iii) light access stairs and gangways not more than 600 mm wide	0.25	✓
	(iv) light pedestrian traffic routes in industrial and storage buildings except designated escape routes	0.5	✓
	(v) areas not susceptible to overcrowding in office and institutional buildings, also industrial and storage buildings except as given above	1.0	✓
Areas where people might congregate	(vi) areas having fixed seating within 530 mm of the barrier, balustrade or parapet	1.5	X
Areas with tables or fixed seating	(vii) restaurants and bars	1.5	X
Areas without obstacles for moving people and not susceptible to overcrowding	(viii) stairs, landings corridors ramps	1.0	✓
	(ix) external balconies including Juliette balconies and edges of roofs; footways and pavements within building cartilage adjacent to basement/sunken areas	1.0	✓
Areas susceptible to overcrowding	(x) footways or pavements less than 3 m wide adjacent to sunken areas	1.5	X
	(xi) theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studios; footways or pavements greater than 3 m wide adjacent to sunken areas	1.5	X
	(xii) grandstands and stadia	(Note 1)	-

Type of Occupancy for Part of the Building	Examples of Specific Use	Uniformly Distributed Load Applied to the Infill (kN/m ²)	21.5 mm PVB Glass
Retail areas	(xiii) all retail areas including public areas of banks/building societies or betting shops	1.5	X
Vehicular	(xiv) pedestrian areas in car parks, including stairs, landings, ramps, edges of internal floors, footways, edges of roofs	1.5	X
	(xv) horizontal loads imposed by vehicles	(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

PLATES

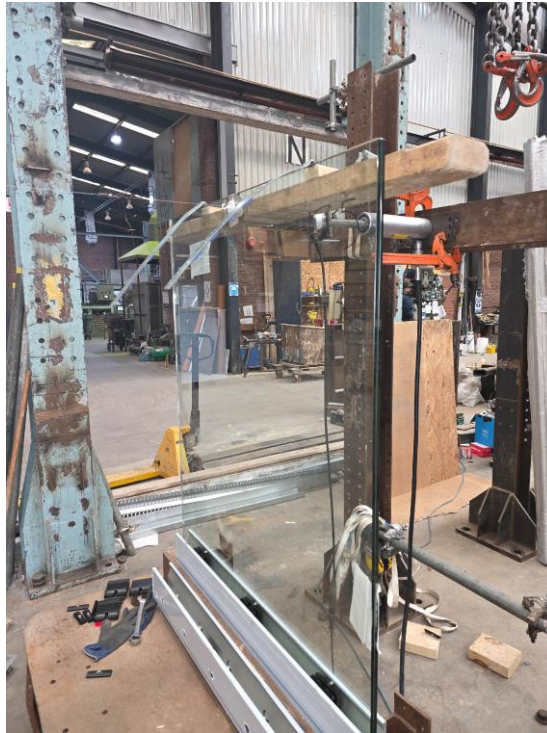


Plate 1 – Generic Test Configuration Horizontal Line Load



Plate 2 – Generic Test Configuration Uniformly Distributed Load

Chart 1 - Load Deflection Curve for Posi-Lite System Base Mounted into Steel when Subjected to a Uniformly Distributed Line Load

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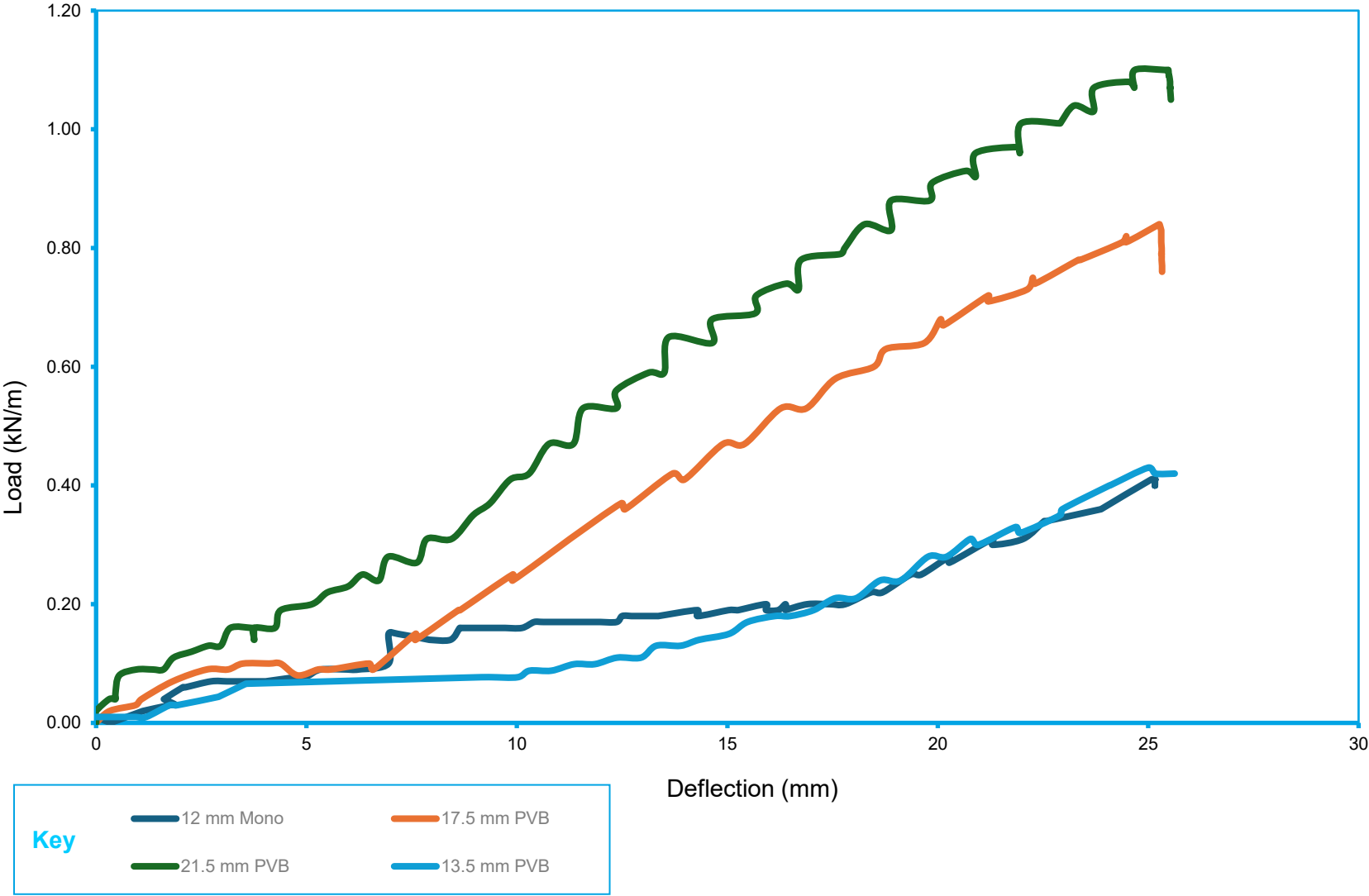
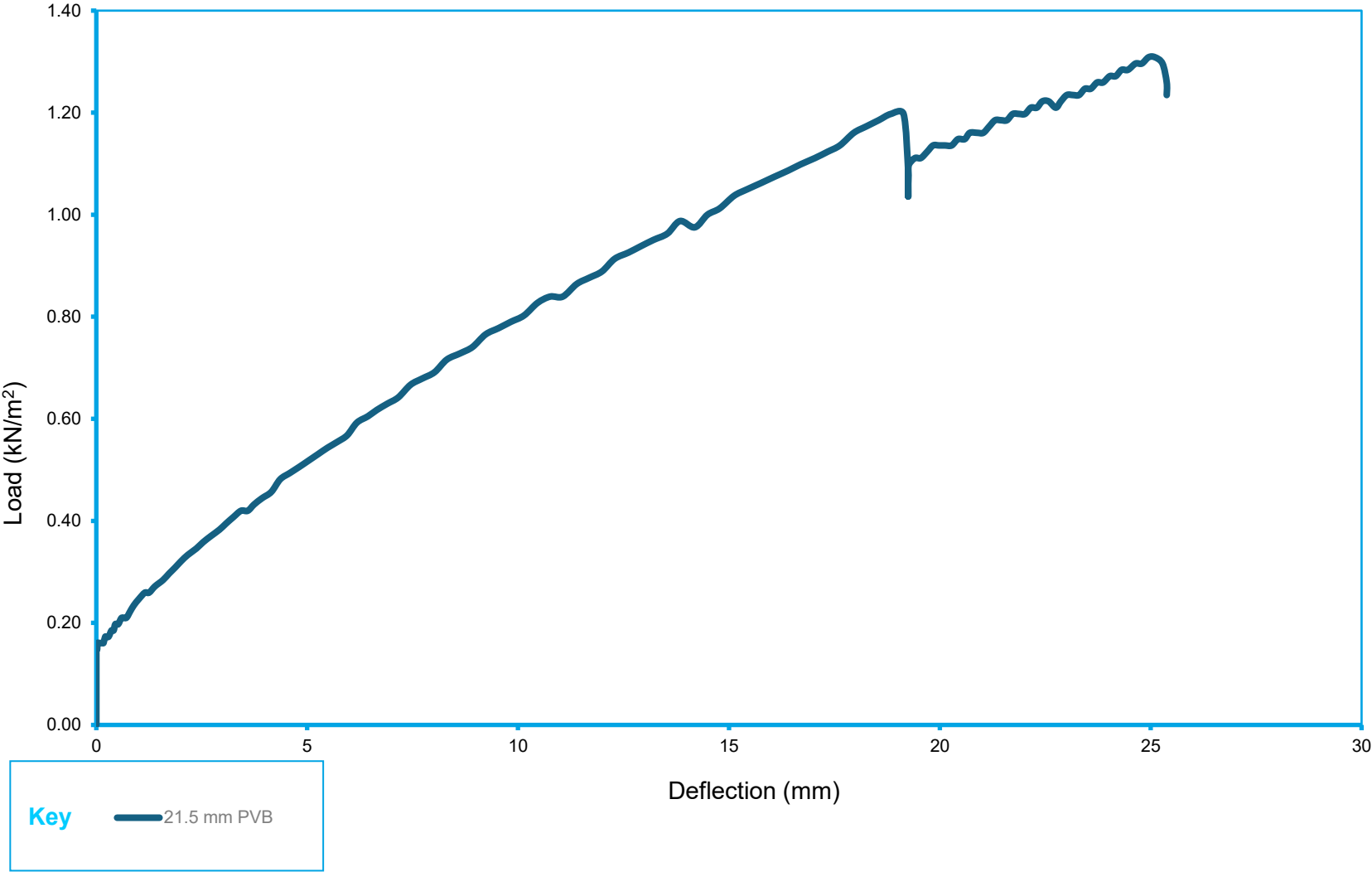


Chart 1 - Load Deflection Curve for Posi-Lite System Base Mounted into Steel when Subjected to a Uniformly Distributed Load

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APPENDIX A – Client's Drawings

