

TEST REPORT

Lucideon Reference: 182262 (QT-50274/1/GMB)/Ref. 1

Project Title: Testing of Pure Vista MegaGrip Balustrade System Incorporating 25.5 mm PVB Glass in Accordance with BS 6180:2011

Client: Pure Vista Ltd
Pendewey
Stony Lane
Bodmin
Cornwall
PL31 2QX

For the Attention of: Mr Adam Oakes & Mr Mark Oakes

Author(s): Miss Lisa Cobden

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Mr Justin Fryer
**Consultancy Team
Reviewer**



Miss Lisa Cobden
**Consultancy Team
Project Manager**



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1 INTRODUCTION

Lucideon Limited were commissioned by the client, Pure Vista Ltd, to carry out 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.

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:

- MegaGrip.

The system had been designed and intended to be used as the base mount for free standing balustrades. The system and glass was installed by Pure Vista personnel.

3 TEST PROGRAMME

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

- MegaGrip into Concrete:
 - 25.5 mm PVB Glass;
- MegaGrip into Steel:
 - 25.5 mm PVB Glass.

4 TEST PREPARATION

4.1 MegaGrip Concrete Fix

The channel was bolted to the top of a concrete block, which was fixed to the floor of the test facility.

The 1.0 m length of channel was bolted to the block at 200 mm centres, 100 mm from the end and 200 mm thereafter). The clamps were installed at 4 clamps per meter, spaced at 100 mm from the edge with 200 mm between clamps.

4.2 MegaGrip Steel Fix

The channel 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 1.0 m length of channel was bolted to the steel C section at 200 mm centres, 100 mm from the end and 200 mm thereafter). The clamps were installed at 4 clamps per meter, spaced at 100 mm from the edge with 200 mm between clamps.

5 TEST METHOD

A horizontal imposed line load was applied to the glass at a given height above the datum level of the floor and the deflection measured at varying points on the panel. The load application point and position of the transducer are given in Table 1. The load was applied via a hydraulic ram and the deflection measured using a linear voltage displacement transducer (see Plate 1). The samples were tested until destruction occurred or until 25 mm of deflection was recorded at which point the test was stopped.

Table 1 - Load Application and Transducer Position

System	Fix	Glass	Load Application (mm)	Transducer Position (mm)
MegaGrip	Concrete	25.5 mm PVB	1200	1200
MegaGrip	Concrete	25.5 mm PVB	1500	1500
MegaGrip	Steel	25.5 mm PVB	1100	1800
MegaGrip	Steel	25.5 mm PVB	1200	1200

6 RESULTS

The tests were carried out in accordance with the guidance given in BS 6180 Barriers in and about buildings – Code of Practice. The standard states that the maximum allowable deflection for a free standing glass protective barrier panel when loaded at a minimum height of 1100 mm is 25 mm.

The loads achieved by the Pure Vista systems tested under horizontal imposed line load are given in Tables 1 - 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 2 - Summary of Performance of Pure Vista MegaGrip Balustrade System Mounted into Concrete Tested under Horizontal Imposed Line Load

Fix	Glass Type	Load Application (mm)	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)
Concrete	25.5 mm Laminated PVB	1200	1200	1.81	1.50	19.43
Concrete	25.5 mm Laminated PVB	1500	1500	1.03	0.74	18.15

Table 3 - Summary of Performance of Pure Vista MegaGrip Balustrade System Mounted into Steel Tested under Horizontal Imposed Line Load

Fix	Glass Type	Load Application (mm)	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)
Steel	25.5 mm Laminated PVB	1100	1800	2.04	1.50	17.01
Steel	25.5 mm Laminated PVB	1200	1200	2.06	1.50	16.68

Table 4- Summary of Suitability of Pure Vista MegaGrip Base Mounted into Concrete 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)	Concrete		Steel	
			25.5 mm PVB Glass (1200mm)	25.5 mm PVB Glass (1500mm)	25.5 mm PVB Glass (1100mm)	25.5 mm PVB Glass (1200mm)
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	✓	✓



Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Concrete		Steel	
			25.5 mm PVB Glass (1200mm)	25.5 mm PVB Glass (1500mm)	25.5 mm PVB Glass (1100mm)	25.5 mm PVB Glass (1200mm)
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	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	✓	✓
Vehicular	(xiv) pedestrian areas in car parks, including stairs, landings, ramps, edges of internal floors, footways, edges of roofs	1.50 (Note 2)	✓	X	✓	✓



Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Concrete		Steel	
			25.5 mm PVB Glass (1200mm)	25.5 mm PVB Glass (1500mm)	25.5 mm PVB Glass (1100mm)	25.5 mm PVB Glass (1200mm)
	(xv) horizontal loads imposed by vehicles	3.0 (Note 2)	-	-	-	-

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

END OF REPORT

PLATE



Plate 1 – Generic Test Configuration



Chart 1 - Load Deflection Curve for Pure Vista MegaGrip System Incorporating 25.5 mm PVB Glass Fixed into Concrete

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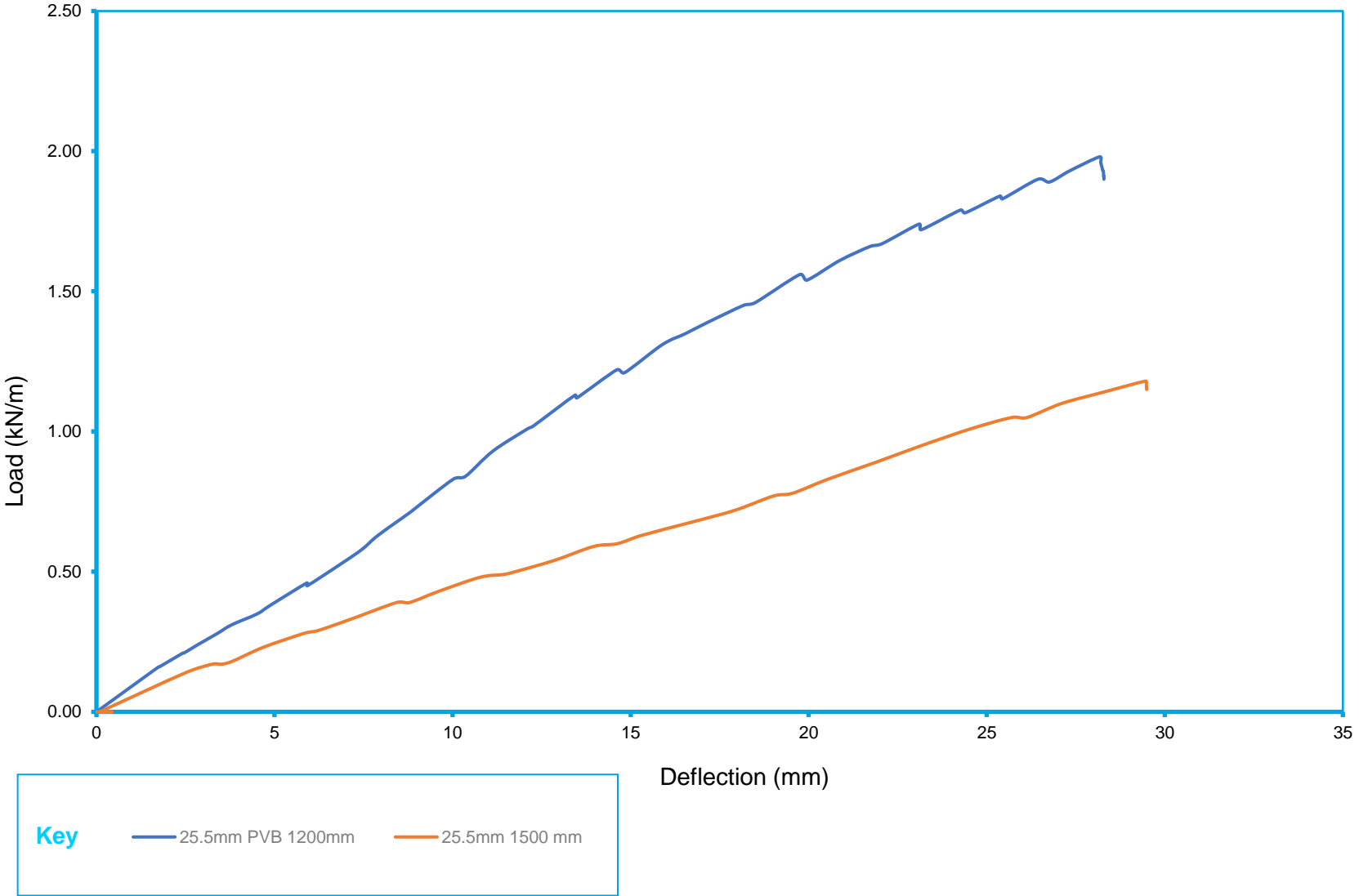




Chart 2 - Load Deflection Curve for Pure Vista Posi-Glaze System Incorporating 25.5 mm PVB Glass Fixed into Steel

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