

REPORT HOLDER

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PRODUCT DESCRIPTION

Railing System for high rise balconies.

ASSESSED COMPLIANCE

- 2015, 2009 and 2006 International Building Code® (IBC)
- 2015, 2009 and 2006 International Residential Code® (IRC)

CertMark International Pty Ltd (CMI) has awarded this Evaluation Report to the company named above for the system described herein. The System has been assessed by CMI as being fit for purpose providing they are installed, used and maintained as set out in this Evaluation Report.

For and on behalf of CMI



John Thorpe
Chief Executive Officer

16/02/2018
Date of Issue

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1. PRODUCT INFORMATION

The StructGlass Railing System includes a series of railing panels ranging from 150mm to 1800mm in width.

Glass Barrier	Toughened/Laminated with SGP Interlayer
Glass Thickness	11.52 (5/1.52/5)mm
Glass Installation Type	Aluminium post, 2 piece full vertical clamp
Post Material	Aluminium
Post Overall size	25mm x 80mm x 1348mm

2. SCOPE OF USE

The StructGlass Railing System described in this report is intended for interior and exterior weather exposed applications, and are suitable for use in most natural environments. The StructGlass Railing System may be used for residential commercial and industrial applications for guards along balconies, porches, mezzanines stairs and similar locations except where vehicular impact resistance is required. The system is compatible with all construction types.

Properties Evaluated:

- Structure;
- Durability.

3. CONDITIONS AND LIMITATIONS

This Evaluation Report is issued based on the evidence of compliance as detailed herein. Any deviation from the specifications contained in this report is outside of this document's scope and the installation of the certified system will not be covered by this Evaluation Report. This may result in the product being classified as a non-conforming building product/system.

4. WARRANTY

The StructGlass Railing System is accompanied by the following warranties available USA wide.

- 10 years Glass warranty;
- 20 years structural frame & powder coat warranty.

5. BASIS OF THIS EVALUATION REPORT

This Evaluation Report has considered the following aspects in issuing this recognition:

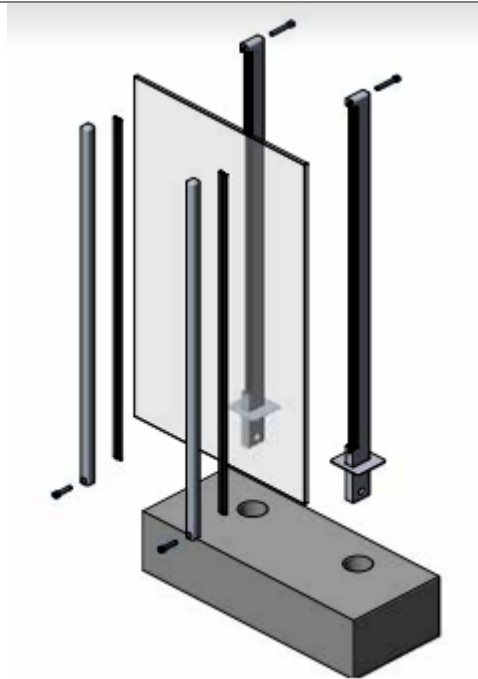
- Installation procedures
- Physical Properties
- Relevant IBC requirements
- The ability of the installation details to meet the requirements of the 2015, 2009, and 2006 IBC, and applicable international standards.

6. TECHNICAL SPECIFICATIONS

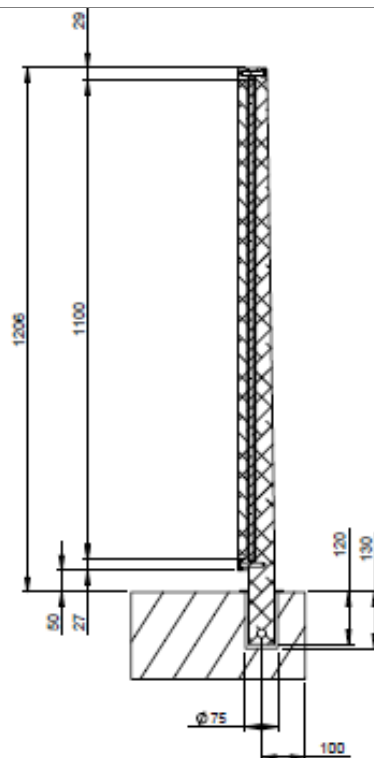
Materials

1. Solid Aluminium Powder coated CNC machined posts
2. SGP interlayer Structural Laminated Glass- Multiple color variations and art work can be incorporated

Post assembly
Post cover plate
Glass



Indicative installation
(mm)



Design

Loading: The applicable project-specific loads must be identified. Minimum required loads are one of the following:

- 50plf (0.73kN/m) on the top rail in any direction;
- 200lbs (0.89kN) on the top rail in any direction, and 50lbs (0.22kN) on one square foot at any location perpendicular to the glass railing;
- The wind load on the full area of glass, in psf;
- Wind load must be determined by a qualified individual based on the project-specific conditions, taking into account the railing location on the structure. For installations in compliance with the IRC Section R312, the 50plf (0.73kN/m) top rail load is not applicable.

7. SYSTEM CONFIGURATIONS

Testing Configuration 150mm Panel

Glass Panel Size	1150mm x 150mm
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0388.17)
Post Overall size	25mm x 80mm x 1348mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
Outwards	900N (600) N	428mm	429mm	1mm
Downwards	900N (600) N	422mm	423mm	1mm
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
350 N/m	N/A	N/A	N/A	Not tested
750N/m	168.75 N (112.5 N)	423mm	423mm	0mm

Source: Azuma Design Pty Ltd Test report AZT0388.17

Testing Configuration 300mm Panel

Glass Panel Size	1150mm x 300mm
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0389.17)
Post Overall size	25mm x 80mm x 1348mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	185.4mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
Outwards	900 N (600) N	470mm	471mm	1mm	
Downwards	900 N (600) N	429mm	429mm	0mm	
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
350 N/m	N/A	N/A	N/A	Not tested	
750N/m	337.5 N (225 N)	429mm	429mm	0mm	

Source: Azuma Design Pty Ltd Test report AZT0389.17

Testing Configuration 450mm Panel

Glass Panel Size	1150mm x 450mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0390.17)
Post Overall size	25mm x 80mm x 1348mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment

Spacing between posts	278.1mm
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Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
Outwards	900 N (600) N	445mm	448mm	3mm	
Downwards	900 N (600) N	428mm	428mm	0mm	
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
350 N/m	N/A	N/A	N/A	Not tested	
750N/m	506.25 N (337.5 N)	428mm	428mm	0mm	

Source: Azuma Design Pty Ltd Test report AZT0390.17

Testing Configuration 600mm Panel

Glass Panel Size	1150mm x 600mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0391.17)
Post Overall size	25mm x 80mm x 1348mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	370.8mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
Outwards	900 N (600) N	457mm	458mm	1mm	
Downwards	900 N (600) N	427mm	427mm	0mm	
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
350 N/m	N/A	N/A	N/A	Not tested	

750N/m	675 N (450 N)	427mm	427mm	0mm
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Source: Azuma Design Pty Ltd Test report AZT0391.17

Testing Configuration 750mm Panel

Glass Panel Size	1150mm x 750mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0392.17)
Post Overall size	25mm x 80mm x 1348mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	463.5mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
Outwards	900 N (600) N	464mm	464mm	0mm	
Downwards	900 N (600) N	423mm	424mm	1mm	
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
350 N/m	N/A	N/A	N/A	Not tested	
750N/m	843.75 N (562.5 N)	424mm	424mm	0mm	

Source: Azuma Design Pty Ltd Test report AZT0392.17

Testing Configuration 900mm Panel

Glass Panel Size	1150mm x 900mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm

Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0393.17)
Post Overall size	25mm x 80mm x 1348mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	556.2mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
Outwards	900 N (600) N	469mm	471mm	2mm
Downwards	900 N (600) N	434mm	434mm	0mm
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
350 N/m	N/A	N/A	N/A	Not tested
750N/m	1012.5 N (675 N)	434mm	434mm	0mm

Source: Azuma Design Pty Ltd Test report AZT0393.17

Testing Configuration 1050mm Panel

Glass Panel Size	1150mm x 1050mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0394.17)
Post Overall size	25mm x 80mm x 1348 mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	648.9mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
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Outwards	900 N (600) N	457mm	458mm	1mm
Downwards	900 N (600) N	428mm	428mm	0mm
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
350 N/m	N/A	N/A	N/A	Not tested
750N/m	1181.25 N (787.5 N)	428mm	428mm	0mm

Source: Azuma Design Pty Ltd Test report AZT0394.17

Testing Configuration 1200mm Panel

Glass Panel Size	1150mm x 1200mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0395.17)
Post Overall size	25mm x 80mm x 1348mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	741.6mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
Outwards	900 N (600) N	463mm	464mm	1mm
Downwards	900 N (600) N	429mm	429mm	0mm
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
350 N/m	N/A	N/A	N/A	Not tested
750N/m	1350 N (900 N)	429mm	429mm	0mm

Source: Azuma Design Pty Ltd Test report AZT0395.17

Testing Configuration 1350mm Panel

Glass Panel Size	1150mm x 1350mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0396.17)
Post Overall size	25mm x 80mm x 1348mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	834.3mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
Outwards	900 N (600) N	443mm	444mm	1mm
Downwards	900 N (600) N	432mm	432mm	0mm
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
350 N/m	N/A	N/A	N/A	Not tested
750N/m	1518.75 N (1012.5 N)	432mm	432mm	0mm

Source: Azuma Design Pty Ltd Test report AZT0396.17

Testing Configuration 1500mm Panel

Glass Panel Size	1150mm x 1500mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0397.17)
Post Overall size	25mm x 80mm x 1348mm

Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	927mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
Outwards	900 N (600) N	456mm	456mm	0mm	
Downwards	900 N (600) N	429mm	429mm	0mm	
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
350 N/m	N/A	N/A	N/A	Not tested	
750N/m	1687.5 N (1125 N)	429mm	429mm	0mm	

Source: Azuma Design Pty Ltd Test report AZT0397.17

Testing Configuration 1650mm Panel

Glass Panel Size	1150mm x 1650mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0398.17)
Post Overall size	25mm x 80mm x 1348 mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	1019.7mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent (mm)	deflection
Outwards	900 N (600) N	464mm	466mm	1mm	
Downwards	900 N (600) N	529mm	529mm	0mm	

Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
350 N/m	N/A	N/A	N/A	Not tested
750N/m	1856.25 N (1237.5 N)	529mm	529mm	0mm

Source: Azuma Design Pty Ltd Test report AZT0398.17

Testing Configuration 1800mm Panel

Glass Panel Size	1150mm x 1800mm
Glass installation Type	Aluminium post 2, piece full vertical clamp
Gap between bottom of barrier and ground level	62mm
Complies with AS 2208:1996	Yes (Azuma Design Pty Ltd Test report AZT0389.17)
Post Overall size	25mm x 80mm x 1348 mm
Base Plate	100mm x 100mm x 2mm
Fixing methods	80mm hole core drilled, 120mm embedment
Spacing between posts	1112.4mm

Results

Direction	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
Outwards	900 N (600) N	508mm	209mm	1mm
Downwards	900 N (600) N	529mm	529mm	0mm
Uniformly Distributed Load	Load applied	Datum (mm)	Reading after Load removed	Permanent deflection (mm)
350 N/m	N/A	N/A	N/A	Not tested
750N/m	2025 N (1350 N)	529mm	529mm	0mm

Source: Azuma Design Pty Ltd Test report AZT0399.17

Note: The minimum height of the barrier is typically 1050mm FFL. The one section in which is subject to a walkway has been raised to 1300mm FFL, and all railing sections have an 850mm No Climb Zone. No gap larger than 125mm is incorporated into the design, and is typically 50mm. Both wind and human impact loads have been considered for the engineering of the railing.

8. RELEVANT TECHNICAL LITERATURE

1. Kuraray Report; Analysis of laminated glass panel; Dated 03/11/2014.
2. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0388.17; 150mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
3. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0389.17; 300mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
4. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0390.17; 450mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
5. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0391.17; 600mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
6. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0392.17; 750mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
7. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0393.17; 900mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
8. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0394.17; 1050mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
9. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0395.17; 1200mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
10. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0396.17; 1350mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
11. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0397.17; 1500mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
12. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0398.17; 1650mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.
13. Azuma Design Pty Ltd; NATA Accreditation #15147; Report No. AZT0399.17; 1800mm panel testing to AS 1170.0:2011, AS 1170.1:2002 & Appendix B&C of AS 1657-2013; Dated 12/10/2017; Shows compliance to Structure & Fall prevention barriers.

9. INSTALLATION

Installation of the StructGlass Railing System must comply with the manufacturer's published instructions, this report and 2015 IBC Sections 1013 and 1607.8.1, 2009 IBC Section 1607.7.1, IBC Section 2407, or IRC Section R312, whichever is applicable. The StructGlass Railing System must be installed by an approved installer and in line with: StructGlass installation drawings Prototype-Glass-Balustrade-Rev-E.

10. MANUFACTURER'S INSTALLATION INSTRUCTIONS

CMI representatives have inspected installations of the systems and found the level of performance satisfactory

11. BASIS OF THIS EVALUATION REPORT

This Evaluation Report has considered the following aspects in issuing this recognition:

- Installation procedures
- Physical Properties
- Relevant IBC requirements
- The ability of the installation details to meet the requirements of the 2015, 2009, and 2006 IBC, and applicable international standards.

12. EVALUATION SUMMARY

In the opinion of CertMark International, that the StructGlass Railing System is fit for purpose and will comply with 2015 IBC Sections 1013 and 1607.8.1, 2009 IBC Section 1607.7.1, IBC Section 2407, or IRC Section R312 to the extent specified in this Evaluation Report provided it is used, designed, installed and maintained as set out in this Evaluation Report.

This Evaluation Report is issued only to Aluminium Balustrades North Coast (ABnc) Pty Ltd and is valid until expiry, subject to the Conditions of Evaluation Report.

13. VALIDITY OF THE FINDING

Condition:

This Evaluation Report applies only to StructGlass Railing System as described here in.

Withdrawal:

This Evaluation Report will be withdrawn or amended if CMI considers that a change in design or manufacturing quality renders the basis of the appraisal invalid, or if reported field experience convinces CMA of unsatisfactory quality or performance.

Term of Validity:

This CertMark assessment will expire two years from the date of issue unless revalidation has been requested and granted.

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