



Altair Louvre Window Load Testing To New Zealand Requirements

Breezway Technical Bulletin

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In light of recent changes to barrier compliance requirements for building elements in New Zealand, windows must comply with the appropriate New Zealand materials Standards using the loads given in the Standard AS/NZS 1170.1:2002 clause 3.6 and Table 3.3. New Zealand "Guidance on Barrier Design" March 2012 defines Infill as: "The building element (e.g. wires, rail, mesh, safety glass or other solid panel, louvres, balusters) spanning between supporting structure, posts or rails". Fall prevention requirements also apply in certain circumstances where an opening anywhere in the barrier must be of such a size that a 100mm diameter sphere cannot pass through them.

Test Methodology

The Breezway Research & Development Team designed and documented a test methodology that can be used to prove compliance with the New Zealand "Guidance on Barrier Design" and proposed changes to the NCC 2013.

The test consists of applying a load over an area of 2,000 mm² in the centre of a louvre blade with the window in the closed position, fully open position or in a restricted opening position. The louvre window will be considered to have passed the test if every part of the frame is still intact and the window is still operable. Any dislodgement of blades from the clips, dislodgement of the frame, dislodgement of any part of the frame or any failure which prevents the window from operating normally will be considered a failure. The load is applied to the window for 15 minutes and the test must be repeated 3 times.

Testing is conducted to the loads specified in AS/NZS 1170.1:2002 Table 3.3 and consideration is taken for the barrier loads to be multiplied by the appropriate combination factors for both the ultimate and design states as per Section 4 Clause 4.2.2 of AS/NZS 1170.0. These calculated loads are set out in the table below.

Type of occupancy for part of the building or structure		Specific uses	Infill	
			Any direction (see Note 2)	
			Design Pressure in kN (see Note 1)	Ultimate Pressure in kN (see Note 3)
A	Domestic and residential activities	All areas within or serving exclusively one dwelling including stairs, landing etc. but excluding external balconies and edges of roofs (see C3)	0.25	0.375
		Other residential (see also C)	0.5	0.75
B,E	Offices and work areas not included elsewhere including storage areas	Light access stairs and gangways not more than 600mm wide	N/A	N/A
		Fixed platforms, walkways, stairways and ladders for access (see Note 1)	N/A	N/A
		Areas not susceptible to overcrowding in office and institutional buildings also industrial and storage buildings	0.5	0.75
C	Areas where people may congregate			
C1/ C2	Areas with tables or fixed seating	Areas with fixed seating adjacent to a balustrade, restaurants, bars etc.	1.5	2.25
C3	Areas without obstacles for moving people and not susceptible to over crowding	Stairs, landings, external balconies, edges of roofs etc.	0.5	0.75
C5	Areas susceptible to over crowding	Theatres, cinemas, grandstands, discotheques, bars, auditoria, shopping malls (see also D), assembly areas, studios etc.	1.5	2.25
D	Retail areas	All retail areas including public areas of banks/building societies, (see C5 for areas where overcrowding may occur)	1.5	2.25

Note 1: Based on AS/NZS 1170.1:2002 Structural design action, Table 3.3, Infill – any direction

Note 2: Applied over a panel of 2000mm²

Note 3: ULS as per AS 1170.0 Section 4 Clause 4.2.2

Test Results

Frame	Gallery	Blade	Passed Test Pressure		
			Open Position	100mm Restricted Opening	Closed Position
Altair Louvre Components with Backing Strip	102 Altair Gallery	6mm Thick toughened glass – 700mm blade length	0.187 kN	0.187 kN	0.187 kN
	152 Altair Gallery	6mm Thick toughened glass – 700mm blade length	0.187 kN	0.187 kN	0.187 kN
	152 Altair Gallery with the Stronghold System	6mm Thick toughened glass – 700mm blade length	0.750 kN	0.750 kN	0.750 kN
		6mm Thick aluminium – 700mm blade length	1.125 kN	1.125 kN	1.125 kN

Test reports are available on request and include greater detail on the testing methodology.

These test results show that Altair Louvre Windows with the Stronghold System are suitable for use in buildings of all occupancy types although in some (occupancy types C1, C2, C5 and D) they can only be used more than 1200mm above floor level as per Section 3.4 of New Zealand “Guidance on Barrier Design” which specifies that distributed loads may be reduced by 50% between 1200mm and 2000mm above floor level.