

Window & Door Performance Accreditation



Australian Standards – Windows in Class 1 buildings

Under the Building Code of Australia, window manufacturers are required to produce windows and doors that meet mandatory minimum specifications under Australian Standard (AS) 2047. Windows made from timber, aluminium, uPVC or other materials undergo performance tests to verify product performance.

The specified tests are:

- ✓ **Deflection Test** – positive and negative wind pressures are applied to the face of the window to test the maximum deflection under wind load.
- ✓ **Operating Force Test** – to verify that an opening sash is capable of opening and closing without undue effort.
- ✓ **Air Infiltration Test** – the air leakage of a window is tested to ensure energy and acoustic efficiency.
- ✓ **Water Penetration Test** – to verify that no water leaks through the window into the building.
- ✓ **Ultimate Strength Test** – negative and positive wind pressures are applied to the window to at least 1.5 times the design wind pressure to ensure it does not fail in unusual wind conditions.

Test Procedures and requirements

Preparation for test

Prior to commencement of the main tests listed below, any operable windows or doors are to be opened and closed five (5) times. The sample is to be subject to positive or negative wind pressures being 50% of the nominated deflection test pressures. This is a pre-requirement for each of the main tests. However, when more than one of the tests is to be conducted the preparations need only be conducted once.

Deflection test

Measurements of movement of critical structural members are taken at a range of test pressures in order to determine if the bending of the members exceed the nominated requirements.

The test pressure is dependent on the nominated type of building and region.

No structural members in a completely assembled and glazed window shall deflect by an amount greater than span/150 when tested at the serviceability design wind pressure.

Table 2.1, AS2047

Window Rating	Test Pressure (Pa)
N1	500
N2	700
N3	1000
N4	1500
N5	2200
N6	3000

Operating force test

The forces required to operate sliding doors and windows are measured to test compliance with the requirements. The forces required to initiate and sustain movement of the door/sash in both directions of movement are recorded.

The test force shall be not greater than the value for windows or doors given in Table 2.2

Table 2.2, AS2047

Force (Newtons)	Sliding window type		Sliding doors
	Horizontal	Vertical	
To initiate movement	110	200	180
To sustain movement	90	160	110

Air infiltration test

Air leakage through the entire test sample is measured at the nominated pressures in order to determine if it exceeds the allowable rate.

The air infiltration shall not exceed the value given in Table 2.3

Table 2.3, AS2047

Building type or window type	Pressure direction	Maximum air infiltration, L/s.m ²	
		Pressure 75 Pa	Pressure 150 Pa
Airconditioned	Positive, negative	1.0	1.6
Non-airconditioned	Positive	5.0	8.0
Louvre window	Positive	20.0	Not applicable
Adjustable louvres, residential and commercial buildings	Positive	20.0	32.0

Water penetration resistance test

Water is sprayed onto the outdoor face of the test sample with air pressure simultaneously being applied across it to determine if unacceptable water leakage occurs.

The test pressure is dependent on the nominated type of building and region. During and at the completion of the test there shall have been no penetration of uncontrolled water.

Table 2.4, AS2047

Window ratings	Water penetration resistance test pressure (Pa)	
	All windows except adjustable louvres	Adjustable louvre windows
N1	150	150
N2	150	150
N3, C1	150	150
N4, C2	200	200
N5, C3	300	200
N6, C4	450	200

Test duration: The test pressure shall be maintained for 15 minutes.

Uncontrolled water is defined as:

- (a) water that is not contained in a purpose-built drainage area;
- (b) water that wets or is likely to wet insulation, fixtures and finishes, reveal linings or window furnishings beyond the window frame; or
- (c) water that lies on transoms, rails, sills, etc., that has no designed means of escape to the outside of the product via the drainage system.

Acceptable water penetration is not deemed a failure if-

- (i) minor splashing occurs due to air infiltration, within 1 mm after change of pressure;
- (ii) minor, intermittent leakage on the indoor side of openable sashes, which is contained on sash gaskets, sill tracks and thresholds that are part of a drainage system that allows water to flow to the outside of the product at cessation of the test (constant streams and regular dripping would be regarded as failure); or
- (iii) water running down the indoor face of louvers, which is completely contained within a purpose- built drainage area.

Ultimate strength test

Air pressure greater than the design pressure is applied across the test sample in order to demonstrate that it has a suitable structural safety margin. The test pressure is dependent on the nominated type of building and region.

Windows for housing shall not collapse when subjected to the ultimate strength test and the according pressure in table 2.5.

Table 2.5, AS2047

Window Rating	Ultimate strength Test Pressure (Pa)
N1	700
N2	1000
N3	1500
N4	2300
N5	3300
N6	4500

Collapse is defined as any one, or any combination, of the following:

- (a) Failure or dislodgment of any glazing.
- (b) Dislodgment of a frame or any part of a frame.
- (c) Removal of a light, either with or without its framing sash, from a frame.
- (d) Loss of support of a frame, such as when it is unstable in its opening in the building structure.