



Industry Guide  
to

# Field Testing in New Zealand

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**window  
& glass**  
association nz

[wganz.org.nz](http://wganz.org.nz)

INDUSTRY GUIDE TO FIELD TESTING

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## 1.0 Introduction

This Industry Guide has been developed to assist in the understanding and application of the Window & Glass Association Field Testing Procedures Manual for field testing in Aotearoa New Zealand. It is the intent of this document to provide guidance and an overview of the procedure's manual, including correct test selection, sample selection, applicable test pressures, assessment of ingress, and reporting of findings. Afterall, robust testing and test results are the foundation of any reputable programme.

The focus of the programme is a series of tests which provide both Quality Assurance and diagnostic assessment of installed window systems.

### 1.1 Standards - WGANZ & AAMA

Our members have for many years utilised the standardised field testing procedures documented in the AAMA and/or ASTM test procedures which are recognised in and form the basis for the Window & Glass Association Field Testing Procedures Manual.

Historically we've used the AAMA 501.2 test procedure, to field test for water penetration, however, more recently building projects, project managers, and façade engineers have required more detailed evaluation of watertightness performance like those described in AAMA 502, AAMA 503 and/or ASTM E1105.

These four test procedures form the foundation of the Window & Glass Association Field Testing Programme.

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## 2.0 Field Testing Programme

The Window & Glass Association has developed a Field Testing Accreditation Programme aimed at building a reputable field testing industry in Aotearoa New Zealand, that ensures,

- a structured approach to field testing,
- tests are performed and reported on consistently, fairly, and accurately,
- the correct use of appropriate and calibrated equipment, and
- a better understanding of which tests are applicable to a given situation.

There are two paths to achieving accreditation,

- a) working through the Association's Field Testing Accreditation Programme, or
- b) providing evidence of an appropriate IANZ accreditation.

Applicants are assessed for their understanding of the field-testing procedures and test equipment's correct use and calibration. Accreditation is valid for a calendar year and is renewed annually through an audit process.

Once approved, an annual accreditation certificate is issued, and the company or operator is added to the Register of Accredited Field Testers.

### 3.0 Test Series Overview

The Window & Glass Association Field Testing Procedures includes a series of five different tests, each with a specific set of criteria applicable to a specific situation,

- **WGANZ 501** - Field Checking of Installed Shopfronts, Curtain Walls and Sloped Glazing Systems,
- **WGANZ 501A** - Field Checking of Installed Shopfronts, Curtain Walls and Sloped Glazing Systems with Operable Components,
- **WGANZ 502** - Field Testing of Newly Installed Fenestration Products,
- **WGANZ 503** - Field Testing of Newly Installed Shopfronts, Curtain Walls and Sloped Glazing Systems,
- **WGANZ 1105** - Onsite Water Penetration Testing of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

The correct test for your project can be determined using the flow chart in Figure 1.

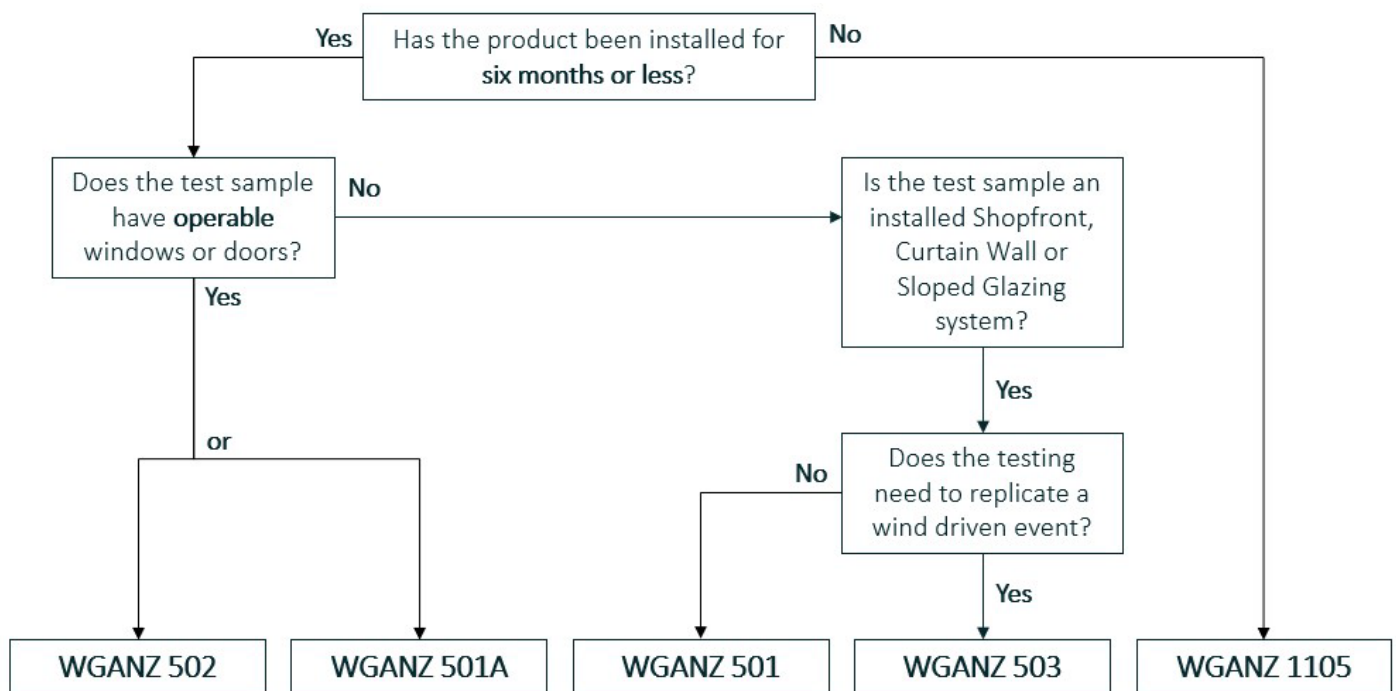


Figure 1: Test Selection Flow Chart

### WGANZ 501

The **WGANZ 501** test method is the standard quality assurance and diagnostic water leakage test method for *“Field Checking of Installed Shopfronts, Curtain Walls and Sloped Glazing Systems”*. The procedure uses a handheld water spray as a quality assurance spot-check during construction of a curtain wall, shopfront, or other fixed window system, to evaluate those joints, gaskets, and sealant details that make up the system.

- This test method is **not** appropriate for testing operable components such as sashes and/or door panels.
- This test method is **only** applicable during construction, prior to building occupancy, but no later than six months after the installation of the fenestration product.



Photo 1 - Spray Wand

### WGANZ 501A

The **WGANZ 501A** test was developed for testing the **installation** of a window or door containing operable sashes and/or door panels, where the operable components are isolated from the water spray. The procedure is intended as a quality assurance spot-check during construction of a curtain wall, shopfront, or other window and/or door system.

- This test method is **only** applicable during construction, prior to building occupancy, but no later than six months after the installation of the fenestration product.

### WGANZ 502

The **WGANZ 502** test is the standard test method for *“Field Testing of Newly Installed Fenestration Products”*, using a fixed spray rack and vacuum chamber. The procedure is intended to evaluate the performance of installed fenestration products for water penetration resistance under controlled and reproducible conditions.

- This test method is **only** applicable during construction, prior to building occupancy, but no later than six months after the installation of the fenestration product.



Photo 2 - Spray Rack

### WGANZ 503

The **WGANZ 503** test is the standard test method for “*Field Testing of Newly Installed Shopfronts, Curtain Walls and Sloped Glazing Systems*”, using a fixed spray rack and vacuum chamber. The procedure is intended to evaluate the performance of installed fenestration products for water penetration resistance under controlled and reproducible conditions.

- This test method is **not** appropriate for testing operable components such as sashes and/or door panels.
- This test method is **only** applicable during construction, prior to building occupancy, but no later than six months after the installation of the fenestration product.



Photo 3 - Example of Vacuum Chamber

### WGANZ 1105

The **WGANZ 1105** test is the standard test method for “*Onsite Water Penetration Testing of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference*”, using a fixed spray rack and vacuum chamber to apply specified static **or** cyclic pressures. The test method is intended for installed exterior windows, curtain walls, skylights, and doors, but may also be used to determine the resistance to water penetration through the joints between the assemblies and the adjacent construction and through claddings.

The test method,

- May be used for newly installed products, i.e.
  - products that have been installed for **six months or less**,
  - but may also be **used after the building is completed** and in service to determine whether reported leakage problems are due to the failure of the installed assemblies to resist water penetration at the specified static air pressure difference.
- Allows for water penetration resistance testing to be carried out using a
  - specified static air pressure differential for 15 minutes (procedure A), **or**
  - testing using a cyclic static air pressure differential (procedure B).

## 4.0 Testing

The Field Testing Procedures Manual sets out the tests and methods for determining the water penetration resistance of selected window and/or door samples. The test methods may be applied to all types of windows and doors or façades, including low and high-rise, commercial, industrial and residential buildings. Testing is to be performed by a Window & Glass Association accredited test operator.

There are four main components of the test,

- Equipment and Calibration
- Test Setup
- Assessment of Water Ingress
- Reporting

**Note:** Failure to comply with, or any deviation from, the prescribed test procedures will invalidate the test. as 'Accredited'.

### 4.1 Equipment and Calibration

Each test specifies not only the equipment required to carry out the test correctly and also defines the required calibration periods. It is vital to the function and outcome of the test that only the specified and calibrated equipment is used to perform the tests.

Calibration dates are to be included in the test report.

Refer to the Test Procedures Manual for further information.

### 4.2 Test Setup

#### WGANZ 501 & 501A

These tests make use of a handheld spray wand, which is moved over the exterior of sample. It is held perpendicular to the test sample at a distance of approximately 305mm. It is recommended the wand has a guide attached to ensure the distance is accurately maintained.

The wand is used to direct water over the sample/test area at a rate of 300mm per minute.

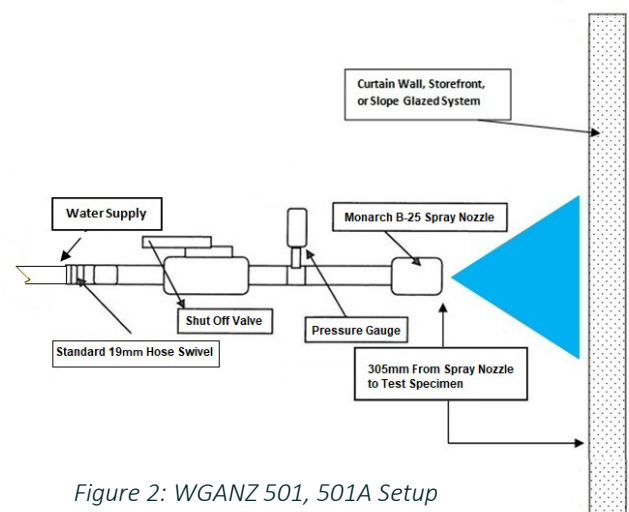


Figure 2: WGANZ 501, 501A Setup



### WGANZ 502, 503, & 1105

This series of tests requires the construction of a temporary enclosure on the interior face of the sample.

A water spray rack is positioned on the exterior of the sample.

The extent of the chamber shall be clearly recorded in the test report.

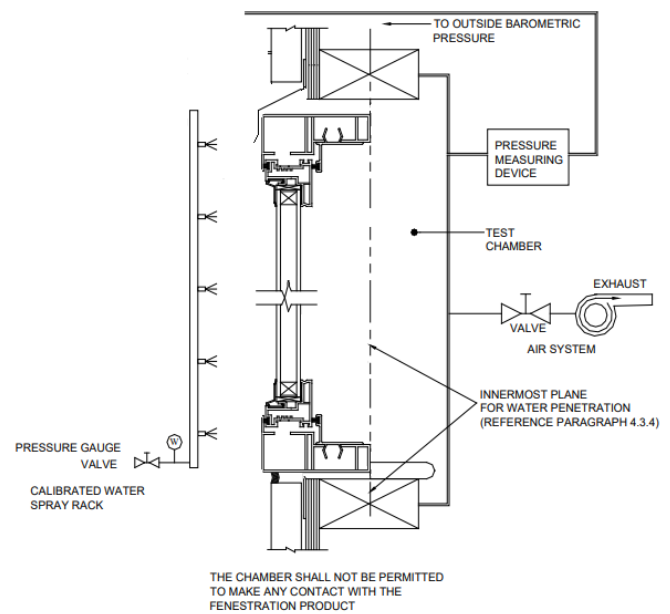


Figure 3: WGANZ 502, 503, 1105 Setup

#### 4.2.1 Sampling

Typically, the test sample's size and location will be selected and clearly identified within the project documentation. The test samples should be selected by an independent party, rather than the main contractor/project manager or client. Normal practice is for the façade engineer/architect to nominate the test areas. As a rule, the high risk weathertightness areas are generally selected i.e., at corners to upper levels or very exposed locations.

If no test sample or location has been identified, sampling will be as outlined in the Window & Glass Association Field Testing Procedures Manual - Sections 7.2-7.3, by the approved test operator and provided to the specifier/client for approval.

The test sample shall be inspected prior to testing and,

- compared with the consented drawings and confirmed as correct and compliant
- be complete and ready for test,
- have no outstanding defects, visible damage or irregularities,
- not be selected because of obvious performance problems.

Consideration shall be given to the location of and access to the test sample in respect to costs and test time.

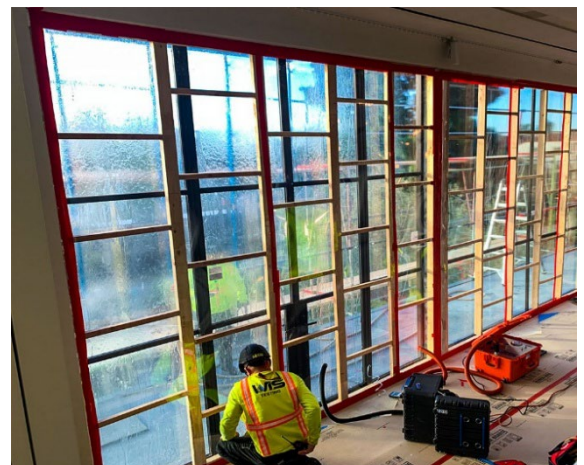


Photo 4 - Example of minimum test area per Section 7.2 of the Procedures Manual



### 4.2.2 Test Pressures

WGANZ 502, WGANZ 503, and WGANZ 1105 tests, each require a differential pressure be applied to simulate windloads on the test sample, to evaluate the water penetration resistance of the test sample.

Test pressures are based on the serviceability limit state pressures *specific to the building* and are set at 20% of the positive SLS wind pressure for the *area of the building being tested*, as described in Table 1.

Field Test Water Test Pressures		
Wind Zone	SLS Pressure (Pa)	Water Test Pressure (Pa)
Low	+/-510	+102
Medium	+/-680	+136
High	+/-970	+194
Very High	+/-1250	+250
Extra High	+/-1515	+303
SED	+SLS * 0.2 = WTP	
SLS = serviceability limit state		
SED = specific engineering design		
WTP = water test pressure (positive pressure on the exterior of the building or test sample)		

Table 1: Water Test Pressures

### 4.3 Assessment of Water Ingress

For each of the Field Testing Procedures, assessment of the pass/fail criteria is based on a visual inspection only of the test sample. The assessment of pass/fail is dependent on the type of product being tested.

#### Fenestration Products – Windows and doors

For installed fenestration products, the pass/fail criteria shall be when uncontrolled water penetration takes place, or when controlled water is not drained away. These are defined as follows,

- a) Uncontrolled water penetration is defined as,
  - Water that is not contained in a purpose-built collection or drainage area,
  - Water that may wet window fixtures and finishes, reveal linings or window furnishings beyond the window frame, or
  - Water that flows in a constant stream on the inside, or regular dripping.
- b) Acceptable water penetration is defined as,
  - Minor splashing which occurs due to air infiltration, within one minute after change of pressure,

- Minor intermittent leakage on the indoor side of operable sashes, which is contained on gaskets, sill tracks, and thresholds.
- c) A purpose-built collection or drainage area is defined as,
  - A system that allows water to collect or be drained to the outside (at the cessation of testing) from sills, other framing members, or in cavities.

### Building Facades and Curtainwalls

For installed building facades, curtainwalls and window/cladding junctions, the pass/fail criteria shall be when one or more of the following occur,

- a) water appears on any inside surface of the facade and is visible from an occupied space, and/or
- b) uncontrolled water appears on any inside surface of the façade, and/or
- c) water appears that is likely to wet insulation, fixtures, and finishes, and/or
- d) water appears in other locations specified as unacceptable by the test specifier.

Where the source of water ingress is unable to be determined through visual inspection only, additional forensic investigation techniques may need to be applied, refer to Section 10 of the Procedures Manual.

## 4.4 Reporting

In addition to providing the client with a record of the test carried out, it is important that the test report provides sufficient information to reproduce the test and ensure repeatability of the test outcomes, if desired/requested.

Section 11 of the Window & Glass Association Field Testing Procedures provides a comprehensive list of information to be included in the formal test report, including a disclaimer when information is supplied by the client that can affect the validity of results. The testing facility shall be responsible for all the information provided in the test report, except where information is provided by the client.

The test report will nominate the calibration certificates for manometers, water pressure gauges and water flow meter, and the test operator will be able to provide copies of the same upon request.

A test report template is available.