

ANDERSEN FIELD TESTING POLICY

This document serves to outline Andersen's position regarding field testing of installed Andersen® products.

Andersen Windows, Inc. recognizes and recommends single unit field testing per Procedure B of AAMA 502-21: Voluntary Specification for Field Testing of Windows and Sliding Glass Doors. This national standard was developed by broad, cross-functional representation of the building industry. This standard outlines the methodology, including testing equipment calibration and accuracy that is required to assess performance of installed fenestration products.

To obtain a copy of AAMA 502-21, please visit: <https://store.fgiaonline.org/pubstore/ProductResults.asp?cat=0&src=502-21>

Andersen Windows, Inc. requires water management applications at time of install as referenced in AAMA 502-21 section 4, and in Andersen installation guides. See below for more detail and go to: www.AndersenWindows.com.

Summary objectives of this Policy:

- Andersen recognizes the AAMA 502-21 standard as a sole means of performing field tests.
- Andersen needs to be present at time of testing.
- The procedures and methods are to be strictly followed.
- The completeness of interior and exterior seals are crucial to the product performance.

FIELD TESTING STANDARDS/PROCEDURES

All testing should be conducted per: **AAMA 502-21: Voluntary Specification for Field Testing of Newly Installed Fenestration Products**

SECTION 1.0 - SCOPE

The AAMA 502-21 document has a specific yet extensive scope, see AAMA 502-21 section 1.0 for more information.

SECTION 2.0 - SIGNIFICANCE AND USE

This section calls out the use and importance of the AAMA 502-21 document.

"2.1 This document provides a method which shall be used to evaluate the performance of newly installed fenestration products for air leakage rate and water penetration resistance under controllable, reproducible and appropriate conditions."

"2.2 The specifier/architect shall use the AAMA 502-21 document to communicate to the fenestration product manufacturer the installed performance for air infiltration and water penetration."

SECTION 3.0 - REFERENCED DOCUMENTS

The AAMA 502-21 uses the latest industry-recognized methods to support and direct use and results. See AAMA 502-21 section 3.0 for more information.

SECTION 4.0 - DEFINITIONS

Refer to AAMA Glossary for definitions.

SECTION 5.0 - TEST METHODS

AAMA 502-21 defines the test procedures to be used for the testing of air leakage (ASTM E 783) and water penetration (ASTM E1105). 5.0 describes the apparatus and outlines the arrangement of the testing and timing; per ASTM E783 and ASTM E1105. Of specific note in this section:

"5.2.1 Testing shall be performed as soon as possible after the fenestration product(s) is installed, and prior to the installation of drywall or interior finish materials. If interior finish materials have been installed, they shall be removed at the test area to allow visual access to these areas to check for water penetration, or other means of visual access shall be provided."

Andersen interprets this to be pertaining to interior trim and other finish materials such as drywall. This is not to be confused with interior air seal (i.e.: sealant or expanding foam, or combinations thereof).

SECTION 6.0 - SAMPLING

Further describes timing, number of samples and testing for air and water outlined in section 5.0. Of specific note in this section:

"6.1 As soon as practical after installation has begun, and a representative number of fenestration products have been completely installed, adjusted, cleaned and perimeter sealed, the agreed upon number of installed fenestration product specimens shall be tested as specified in Section 7.0 for air leakage rate and/or water penetration resistance."

Andersen requires units be inspected for complete install, adjusted, cleaned and very importantly, the exterior and interior seals be in place.

"6.3.1 The entity or party contracting the field testing shall notify the fenestration product installer, manufacturer and the responsible party defined in Section 6.2 of the test schedule. The initial advance notice shall be a minimum of two weeks in advance of the testing in order for the general contractor to notify all fenestration product trades (i.e.: erector, glazier, perimeter caulk contractor, etc.) of the scheduled test date"

Andersen requires notification to be on site for the test.

"6.4.2 The fenestration product(s) shall be representative specimens of typical installations as specified for the project. All exterior and interior perimeter seals shown in the installation instructions shall be in place. The specimen(s) shall have no outstanding punch list items, visible damage or irregularities, including but not limited to torn or damaged gaskets, bent frames, nor be singled out because of manufacturer representative's attention and added to the project punch list. If exterior screens are specified, they shall be in place (closed) during testing."

"6.4.3 Exterior cladding, rain screen and associated components, including the exterior perimeter sealants, shall be installed adjacent to the fenestration product to represent the final detailed conditions of the exterior envelope."

Having exterior perimeter window seals in place are very important for overall product performance and integration with weatherization system of the building.

"6.4.4 After the specimen(s) locations have been selected, the owner's representative shall direct the responsible contractor and manufacturer representative to remove interior finishes (if necessary) to clean the specimen(s), check for proper operation, and to assure that the specimen is installed in accordance with the fenestration manufacturer's installation instructions. Care shall be taken not to disturb the interior side air seal, if present. Interior or exterior components, sealants, etc. that are required for product performance shall not be removed as some product installation require interior side air seal to perform as designed." Further review of this section's entirety is recommended."

Andersen notes the interior air seal is very important for products to perform and should not be removed to allow for viewing as this can cause pressure to be applied in areas that normally would not be exposed. Sealant and backer rod or expandable foam is a common and accepted interior seal per Andersen Installation guides and must not have voids. Plumb, level and square verification of the unit is also very important as well as operational checks.

SECTION 7.0 - TEST PROCEDURES

Describes in detail testing guidelines for determining air and water performance after field installation. Of specific note in this section:

"7.1 Air leakage and water penetration resistance tests shall be performed at pressures specified in Sections 7.4.3 and 7.4.4 unless otherwise stipulated in the Short Form Field Testing Specification. Where both tests are to be conducted in sequence, the test for air leakage shall be conducted before the test for water penetration resistance."

"7.4.1 Air leakage rate shall be determined and adjusted to standard conditions per ASTM E783."

"7.4.4 Unless otherwise specified (see Specifier Note 3), allowable rates of air leakage for the specimen shall be 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for the Product Type and Performance Class, rounded to one decimal place."

Andersen only recognizes Procedure B "cyclical static air pressure difference" for product Classes R, LC, CW. Andersen does not offer AW Class products and therefore Procedure A is not applicable.

"7.5.3 Unless otherwise specified in field testing section of the contract document (See Specifier Note 4) water penetration resistance tests shall be conducted at a static test pressure of $\frac{2}{3}$ of the tested and rated laboratory performance test pressure as indicated by the applicable product designation in AAMA/WDMA/CSA 101/I.S. 2/A44."

Andersen summarizes that this accounts for installation variation. The default pressures used for water penetration resistance tests conducted in the field are not the same as the laboratory test pressures, to allow for field conditions and test methods that vary from the laboratory test conditions and test methods. These conditions are primarily related to the ambient environmental conditions and the installation. The certified product performance is based on laboratory testing performed under controlled laboratory conditions. The temperature, wind and barometric pressure conditions during a field test will typically vary from the standard laboratory conditions.

The field installation conditions also influence the product performance. Products tested in the laboratory are perfectly plumb, level and square in a precision-built opening. Field test specimens, although installed within acceptable industry tolerances, are rarely perfectly plumb, level and square. Shipping, handling, acts of subsequent trades, aging and other environmental conditions all may have an adverse effect upon the performance of the installed specimen. A $\frac{1}{3}$ reduction of the test pressure for field testing is specified as a reasonable adjustment for the differences between a laboratory test environment and a field test environment.

"7.5.7 With all operable portions of the specimen closed and locked, the specimen shall be subjected to a water penetration test in accordance with ASTM E1105 procedure "A" or "B" in accordance with Section 7.5.1. Procedure "A" shall consist of 15-minute test with continuous pressure and water application. When using procedure "B" each of the four cycles shall consist of five minutes with pressure applied and one minute with pressure released during which the water spray is continuously applied."

"7.5.8 Observe and note all points of water penetration, if any, that occur during the test. If the origin of the water penetration cannot be definitively attributed to either the fenestration product specimen or the joint between the fenestration product specimen and surrounding condition, a forensic evaluation shall be performed using the procedures outlined in AAMA 511, while maintaining the test pressures defined in the field testing specifications, and employing the test methods defined in AAMA 502."

Andersen requires that should a failure occur after conducting an AAMA approved test, it must be thoroughly documented with confirmation of the testing method used (to include testing pressure), a complete set of photos illustrating the window unit, the area of the suspected intrusion and the visible installation detail. Additionally, the documentation must include specific descriptions of all facts that are pertinent to the job site situation and details on performance of the product. In the rare event the failure is related to the window unit itself, a determination will be made by Andersen regarding the necessary repair procedure to prepare the unit to be retested.

FIELD TESTING STANDARDS/PROCEDURES

SECTION 7.0 - TEST PROCEDURES *(continued)*

"7.5.8.1 Water penetration shall be defined as follows:

- Water penetration attributable to the surrounding wall conditions –the presence of water not contained within drained flashing, gutters, and sills which did not originate from the fenestration product or the joint between the fenestration product specimen and the wall/roof.*
- Water penetration attributable to the fenestration product Specimen – shall be per ASTM E1105.*
- Water penetration attributable to the perimeter joint –water not controlled by a management system that indisputably originates at the perimeter joint (see Figures 3 and 4)."*

Andersen notes any water inward of and breaking the interior most plane of fenestration product as a failure.

SECTION 8.0 - CALIBRATION AND VALIDATION

Describes the calibration and validation requirements of the pressure measuring apparatus.

Andersen requires that the equipment used for performing air and water tests be in accordance with the tolerances in ASTM E283 and E783 for air and E1105 for water.

SECTION 9.0 - TEST REPORTS

Describes the method by which reporting of the test be documented.

Andersen requires test reports to be done at a minimum in accordance with the guidance and parameters outlined in sections 9.0.