



AMERICAN FOREST & PAPER ASSOCIATION

American Wood Council
Engineered and Traditional Wood Products

October 7, 2008

Michael Beaton, P.E.
Vice President - Whittier Operations
ICC Evaluation Service, Inc.

Re: Proposed Revisions to the Acceptance Criteria for Vinyl Siding, Subject AC37-1008-R1 (MB/CA)

Dear Michael:

Below are suggestions that clarify conditions for which allowable wind pressures determined in accordance with provisions of this AC are applicable.

a) Suggest adding a new Section 5.0, Evaluation Report Recognition:

5.0 Evaluation Report Recognition

5.1 The evaluation report shall include the following information:

5.1.1 Product description, installation instructions, and packaging and identification information, based on the requirements in Section 2.1 of this criteria.

5.1.2 For applications in excess of the prescriptive requirements of 3.1.2, 3.1.3, 3.2.5.1, or 3.2.5.2, allowable negative wind pressures shall include a description of conditions for which allowable negative wind pressures are applicable based on the test assembly construction and materials. A description of the test assembly construction and materials shall include the following components as applicable: stud spacing, exterior sheathing, and interior sheathing.

5.2 The following statements shall be included in the evaluation report as Conditions of Use:

5.2.1 "The siding shall be installed only on exterior walls."

5.2.2 "The siding shall be installed over solid structural sheathing capable of independently resisting the design wind pressures."

Reason: Allowable negative wind pressures for vinyl siding can vary significantly based on test conditions. For wind areas in excess of the prescriptive cases defined in the codes, Sections 3.1.2, 3.1.3, 3.2.5.1, and 3.2.5.2 of this AC properly tie recognition of the allowable negative wind pressure to the construction and materials in the test assembly. Section 5.1.2 attempts to address the intent of current language in sections 3.1.2, 3.1.3, 3.2.5.1 and 3.2.5.2.

The statement in 5.2.1 is taken from 1.2 Scope.

The statement in 5.2.2 is based on language in 3.1.2, 3.1.3, 3.2.5.1, and 3.2.5.2. Section 5.2.2 is consistent with the test basis for evaluating resistance to negative wind pressures (e.g. vinyl siding installed over structural sheathing capable of independently resisting the design wind pressures - both positive and negative wind pressures).

b) Revise section 3.2.5:

3.2.5 Wind Load: Foam-plastic-backed vinyl siding shall be tested for wind-load resistance with any backing material in place. When tested in accordance with ASTM D 5206, foam-backed vinyl siding shall withstand a minimum test pressure of 30.58 psf (1.465 kPa). The test assembly shall be constructed in a manner consistent with the construction methods and materials that are to be recognized in the evaluation report.

Reason: Ensure that the tested assembly is what is recognized in the evaluation report for allowable negative wind pressure. If structural sheathing capable of independently resisting the design wind pressures is given as a minimum condition of use, then the proposed sentence is not needed to address proper application of the results to prescriptive cases defined in the codes.

c) Revise Section 3.2.5.2. to agree with conditions associated with the minimum test pressure of 30.58 psf given in 3.2.5. The minimum test pressure of 30.58 psf is based on a design wind pressure of 29.1 psf and associated with 110 mph, Exposure B or lower wind speeds in Exposures C and D. IRC applicability limits in 3.2.5.2 can be revised accordingly as follows:

3.2.5.2 Wind Load under the IRC: For applications where the basic wind speed (3-second gust) is less than 110mph (49 m/s) in Exposure B, does not exceed 90 mph in Exposure C or 85 mph in Exposure D, installation shall comply with the prescriptive requirements of IRC Section R703.4.....

A similar revision should be made in Section 3.1.3 applicable to vinyl siding.

d) The terms “unbacked vinyl siding” in 3.1 and backed vinyl siding used throughout the revised AC can be easily mis-understood. At first glance, “unbacked vinyl siding” may suggest the lack of structural sheathing backing for resistance to wind loads. Also, “foam-plastic-backed vinyl siding” can be mistaken as vinyl siding installed over foam-plastic sheathing. A different naming nomenclature would help to eliminate confusion and misapplication. For example, replace “unbacked vinyl siding” with “vinyl siding”. Also, other options for “foam-plastic-backed vinyl siding” include “vinyl siding with integral foam-plastic backing”, “foam-plastic-insulated vinyl siding”, or “insulated vinyl siding”.

Thank you for the opportunity to comment.

Sincerely,
Philip Line, P.E.
Senior Manager, Engineering Research



October 7, 2008

Mr. Mike Beaton, P.E.
ICC Evaluation Service
5360 Workman Mill Road
Whittier, CA 90601

Re: Acceptance Criteria for Vinyl Siding; Subject AC37-1008-R1

Dear Mike:

My comments on the proposed revisions to AC37 are as follows:

- a) Based on test report issued by Architectural Testing, the variability of PEF is substantial. Therefore, the choice of the PEF of 0.70 are non-conservative for many cases, such as Quad 4-1/2" siding with foam sheathing (Table 6), Double 6" siding with foam sheathing and house wrap (Table 9), Double 6" siding with foam sheathing (Table 10), and Double 6" siding with plywood sheathing (Table 12). It appears that a factor of 0.8 is more appropriate, at least when the foam sheathing is used as the backing materials.
- b) In Section 3.2.5, the minimum test pressure is specified as 30.58 psf. I assume this is calculated based on ASTM D3679 by using the PEF of 0.7 and the safety factor of 1.5. This translates to the design wind pressure of 29 psf. This is substantially lower than the design wind pressure for the basic wind speed (3-second gust) of 100 miles per hour and the building height of 40 feet at Exposure C, as specified in Section 3.2.5.1 of this AC, when calculated in accordance with ASCE 7-05. If the PEF is increased to 0.8, this minimum test pressure shall be proportionally increased.
- c) In Section 3.2.5.1, it states that "Allowable wind pressures shall be determined in accordance with Annex A1 of ASTM D3679, using a pressure equalization factor (PEF) of 0.70." I believe the "Allowable wind pressure" shall be corrected as "Test pressure" based on Annex A1 of ASTM D3679. Of course, the 0.7 factor should be replaced by 0.8, as commented above. The same comment applies to Section 3.2.5.2.
- d) Throughout the AC, it has been mentioned several times that the "positive wind loading is not considered, since the siding shall be applied over solid sheathing capable of resisting design wind pressures." This same statement shall be required to be part of the "conditions of use" in every ESR report issued under this AC.

Sincerely,

A handwritten signature in black ink, appearing to read "Borjen Yeh".

Borjen ("B.J.") Yeh, Ph.D., P.E.
Director
Technical Services Division
E-mail: borjen.yeh@apawood.org

REPRESENTING THE ENGINEERED WOOD INDUSTRY



David S. Johnston
Senior Technical Director
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7 October 2008

Michael Beaton
ICC Evaluation Service, Inc.
5360 Workman Mill Road
Whittier, California 90601

RE: AC37-1008-R1

Dear Mr. Beaton:

Thank you for considering the proposed revisions to the *Acceptance Criteria for Vinyl Siding*, AC37, to provide coverage for foam-plastic-backed vinyl siding. We are forwarding two additional items that will help the Evaluation Committee in its consideration of this item.

First is a letter from Joseph A. Reed, PE, Director of Product Engineering and Testing for Architectural Testing Incorporated (ATI), dated August 10, 2007. This letter summarizes the results of the pressure equalization testing performed by ATI (which you have already posted) and recommends a pressure equalization factor (PEF) of 0.70 as a conservative value for all foam-backed vinyl siding, in lieu of further, product-specific testing. The basis of the proposed PEF may not be apparent to readers of the test report alone without this cover letter from Mr. Reed.

Second, in response to the staff request for further information on how manufacturers may substantiate a lower PEF for specific siding profiles, we are providing a letter from Mr. Reed outlining the test methodology and analysis that would be used to determine an alternative PEF. The test results for specific profiles and recommended alternative PEF would be provided by the manufacturer to ICC-ES for review. If found to be acceptable, windload ratings for the specific profiles based on the alternative PEF would be included in the Evaluation Report.

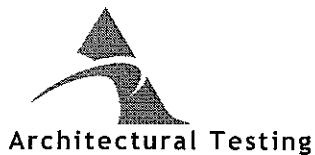
Based on our discussions with you, we believe that this information provides a basis for incorporation of a provision permitting the development of profile-specific PEF values in the proposed revisions to AC37. We would suggest the addition of the following sentence, or equivalent language, at the end of the second paragraph of both section 3.2.5.1 and section 3.2.5.2:

“Where the foam-plastic-backed siding manufacturer provides documentation supporting a different PEF, that PEF is permitted to be used to determine allowable wind pressures.”

Please let me know if you need further information in support of these revisions. I do plan on attending the Evaluation Committee meeting on October 21 and would be happy to answer any questions from the Committee at that time.

Sincerely,

David S. Johnston
Senior Technical Director
Vinyl Siding Institute, Inc.



October 7, 2008

David S. Johnston, Technical Director
Vinyl Siding Institute
1201 15th Street, NW, Suite 220
Washington, District of Columbia 20005

RE: Pressure Equalization Factor Test Procedure for Backed Vinyl Siding

Dear Mr. Johnston:

I am writing this letter to summarize test procedures used by Architectural Testing, Inc. to establish the Pressure Equalization Factor (PEF) for backed vinyl siding reported in ATI Report 68225.01-103-40. I have prepared this summary with the intention that the procedure we used may be considered a model for manufacturers desiring a PEF different from 0.70 which is proposed for the latest revision of ICC-ES acceptance criteria *AC37 Acceptance Criteria for Vinyl Siding*.

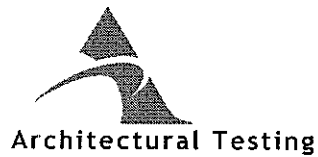
Provision for Determination of Pressure Equalization Factor (PEF)

Test Specimen Type: Manufacture shall specify test specimens based on their relative stiffness as determined from simple load/deflection tests or analytical evaluation of overall profile characteristics. The PEF testing of a particular product shall qualify that product and any similar products deemed less stiff than the tested product to the same PEF.

Test Wall Construction: The test wall shall measure nominally 4' wide by 8' high, and be constructed of 2x4 Spruce-Pine-Fir #2 lumber using four studs, spaced 16" on center, fastened to the top and bottom plates with #8 x 3" drywall screws. Exterior sheathing shall be 1/2" oriented strand board (OSB) sheathing. A vertical joint shall be included in the center of the exterior sheathing. Sheathing shall be covered with an approved water-resistive barrier. The interior of the test wall shall be sheathed with 1/2" unpainted and unfinished gypsum wall board. There shall be a taped horizontal joint in the gypsum wall board. A standard duplex electrical outlet with plastic outlet box shall be installed in the wall.

Procedure: A test chamber shall be constructed that incorporates a vacuum chamber, exterior chamber, test wall and interior chamber (see Sketch 1, attached). The test protocol begins by reducing the pressure in the vacuum chamber to a specified level. The three pressure levels used in the vacuum chamber shall be 50 psf (low pressure), 75 psf (medium pressure), and 105 psf (high pressure). Once the vacuum is stabilized, two pneumatically actuated, 4" diameter valves, located between the exterior chamber and the vacuum chamber, shall be opened instantaneously and simultaneously. System pressures shall be measured at several locations using high speed, high-resolution pressure transducers. Each test wall shall employ five pressure measurement locations on the exterior surface of the sheathing, directly behind the cladding. Pressure shall also be measured in the center of the wall cavity. The average of the five pressure differential readings across the siding is divided by the overall pressure reading across the test wall to determine the Pressure Equalization Factor for the product. The test shall be performed three times at each pressure level. The maximum average PEF for the three pressure levels shall be deemed the PEF or an alternate value may be proposed based on the test results and engineering judgment. PEF values less than 0.36 shall be reported as 0.36.

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Mr. David Johnston.
October 7, 2008
Page 2

Provision for Determination of Pressure Equalization Factor (PEF) (Continued)

Report: A comprehensive report including test specimen selection criteria, test specimen installation, test wall fabrication, test results and calculations shall be prepared by a registered design professional and submitted for review.

I hope this summary of our test procedure is useful to you and ICC-ES. Should you require additional information, do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads "Joseph A. Reed".

Digitally Signed by: Joseph A. Reed

Joseph A. Reed, P.E.
Director – Engineering and Product Testing

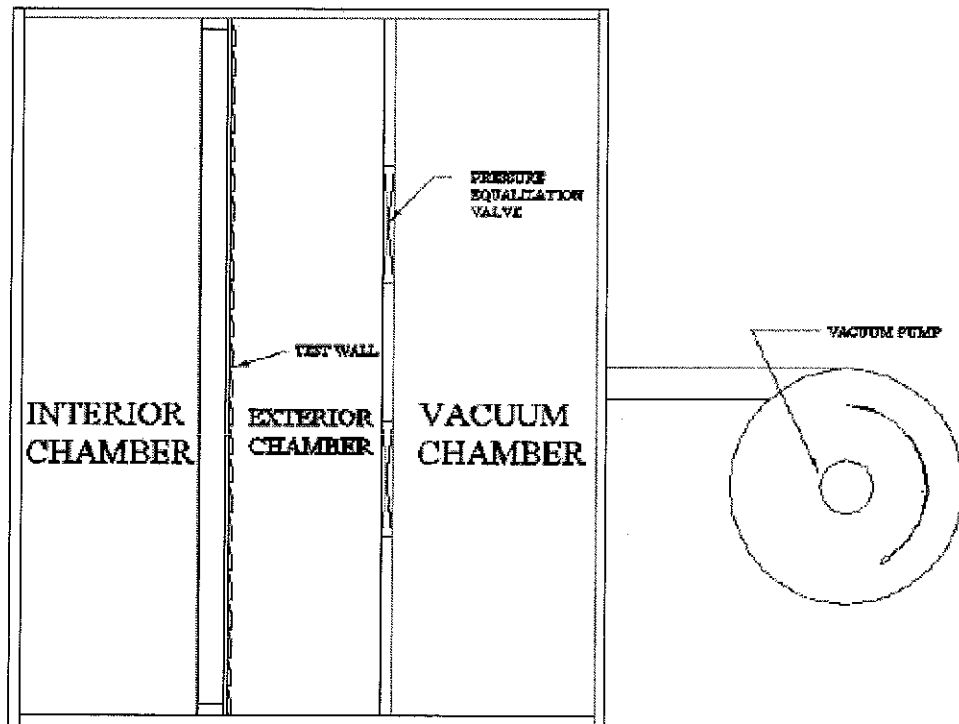
JAR:jar

cc: 68225 02-103-40

Attachments:

Sketch (1 page)

Sketch #1





August 10, 2007

David S. Johnston, Technical Director
Vinyl Siding Institute
1201 15th Street, NW, Suite 220
Washington, District of Columbia 20005

RE: Pressure Equalization Factor for Backed Vinyl Siding

Dear Mr. Johnston:

I am writing this letter to summarize test results recently obtained by Architectural Testing, Inc for pressure equalization factor (PEF) testing of backed vinyl siding and to propose a technical application of the test results.

Architectural Testing, Inc. was contracted by the Vinyl Siding Institute to perform PEF testing on various backed vinyl siding samples at our York, Pennsylvania laboratory. The test equipment and test methods utilized were the same as the previous comprehensive study of vinyl siding which resulted in the acceptance of a 0.36 PEF for vinyl siding in ASTM D3679-04 *Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding*. Three different backed vinyl siding panel sizes (6-1/2", 12" and 18" width) and two different rigid wall constructions (1/2" plywood and 1/2" plywood with housewrap) were tested multiple times at various simulated gust pressures. Even though our product selection for testing was rather limited, it was based on preliminary stiffness testing of many more products. The test results are summarized in the following table.

Product	Wall Construction	Average PEF
6-1/2" Panel Width	1/2" plywood	0.20
	1/2" plywood with housewrap	0.20
12" Panel Width	1/2" plywood	0.68
	1/2" plywood with housewrap	0.33
18" Panel Width	1/2" plywood	0.49
	1/2" plywood with housewrap	0.47

It is my professional opinion that this testing constitutes "approved testing" as stipulated in ASCE 7-02 for specifying lower design pressures for air-permeable cladding (see ASCE 7-02 §6.4.3). And, the average PEF can be used with the methods of ASTM D3679-04 Annex A1 to establish appropriate pressures for static load testing. In lieu of listing all the specific Average PEF reported in the table, it would be conservative to assign a PEF of 0.70 to all backed vinyl siding products until further test data is available.

Sincerely,

Digitally Signed by: Joseph A. Reed

Joseph A. Reed, P.E.
Director – Engineering and Product Testing

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