



ICC Evaluation Service, Inc.
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May 13, 2010

TO: PARTIES INTERESTED IN EVALUATION REPORTS ON WOOD-BASED EXTERIOR COMPOSITE TRIM TREATED WITH ZINC BORATE (ZB) PRESERVATIVE BY A NON-PRESSURE PROCESS

SUBJECT: Proposed Acceptance Criteria for Wood-based Exterior Composite Trim Treated with Zinc Borate (ZB) Preservative by a Non-pressure Process, Subject AC424-0610-R2 (MO/MR)

Hearing Information:

Thursday, June 17, 2009
8:00 a.m.

DoubleTree Hotel

808 South 20th Street
Birmingham, Alabama 35205
(800) 222-8733

Dear Madam or Sir:

The proposed acceptance criteria will be on the agenda for the Evaluation Committee hearing noted above. This is a new criteria covering wood-based exterior composite trim, treated with zinc borate (ZB) preservative by a non-pressure process, that is used as nonload-bearing architectural trim and/or door and window trim on buildings of combustible, nonfire-resistance-rated construction, IBC Type VB, and all construction types permitted under the IRC. The trim is installed over solid backing material — either approved exterior sheathing or approved exterior wall coverings.

On February 2, 2010, the proposed new acceptance criteria was held for further study by the ICC-ES Evaluation Committee. Questions were raised, both in written comments and at the hearing. There were concerns with the scope of the criteria, product definition, testing procedures, standards, and minimum retention for zinc borate (ZB). Specific issues included the following:

1. The minimum retention of zinc borate (ZB) proposed by the criteria was less than that required by AWPAs Standard T1, Section J.
2. The minimum number of test samples of three was discussed as not adequate. The number should be increased to a minimum of ten.
3. There was a request to delete references to product thickness.

4. There was a recommendation that products covered under this criteria should be evaluated to the requirements of ANSI A135.6 as referenced in the 2009 IRC.
5. A recommendation was made to clearly exclude products covered under AC321. (Staff would also add AC203 to this request.)
6. The Composite Panel Association recommended delaying the criteria pending development of a new ANSI standard for hardboard trim.

The proponent has provided their response to the above comments in the attached letter dated March 5, 2010. They have agreed to the revisions described below.

The criteria, as presented at the February 2010 hearing, has been revised for consideration by the committee. The revisions are shown on the attached draft as underline and ~~strikeout~~. The following is a description of the proposed revisions:

1. Section 1.2 was revised to clarify that products covered under AC321 are outside the scope of this criteria.
2. Section 3.1 was revised to refer to transverse wind load as the only structural performance property for this product.
3. Section 4.0 was revised throughout to change the minimum number of sampled laps from three to ten.
4. In Table 2, the nail-head pull-through and lateral resistance was revised to show that the 150-pound minimum is per nail, not lap.

Underline and ~~strikeout~~ are provided to clarify changes made to the proposal since the last committee meeting. The entire criteria is under consideration by the committee, not just the underline and ~~strikeout~~.

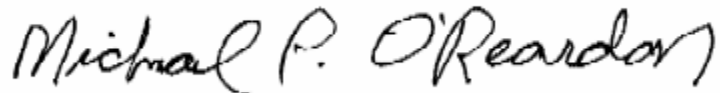
You are cordially invited to submit written comments on agenda items, or to attend the Evaluation Committee hearing and present verbal comments. If you wish to contribute to the hearing, please note the following:

1. Written comments that are received by the Los Angeles business/regional office by **June 1, 2010**, will be forwarded to the committee prior to the hearing, and will be posted on the ICC-ES web site shortly after the comment deadline.
2. Written comments received up to ten days before the meeting, and staff memos responding to comments, will be posted to the web site on **June 10, 2010**.
3. ICC-ES is no longer providing printed copies at the meeting of proposed acceptance criteria, staff memos or public comments. These documents will be available on a limited number of CDs at the meeting, for uploading to computers; and ICC-ES will make arrangements with the hotel business center to have hard copies available for photocopying.

4. Written comments that miss the deadline noted in item (1), above, will only be available at the meeting if you provide 35 copies, collated, stapled, and three-hole punched, either at the meeting itself or to the Los Angeles business/regional office by **June 10, 2010**.
5. If you plan to speak for more than 15 minutes, or offer a visual presentation lasting longer, you should notify ICC-ES staff as far as possible in advance. There will be a computer, projector, and screen available at the meeting for anyone wishing to make a visual presentation, and presentations in most cases will need to be in PowerPoint format. Also, ICC-ES will need to be provided with your presentation at least a half-hour before the start of the relevant meeting session (morning or afternoon) on either a CD or a flash card.
6. If you have any special needs related to a presentation, you should contact ICC-ES staff well in advance of the meeting.
7. Any visual aids for viewing at committee meetings (charts, overhead transparencies, slides, videos, electronic presentations, etc.) will be permitted only if a copy is provided to ICC-ES, before the presentation, in a medium that can be retained with other records of the meeting.
8. Any materials submitted for committee consideration are considered nonconfidential and available for public discussion, as noted in Section 2.7 of the ICC-ES Rules of Procedure for the Evaluation Committee.
9. Prior to the meeting, you should refrain from trying to communicate directly with committee members about agenda items, either verbally or in writing. Committee members reserve the right to refuse such communications.

Your cooperation with these guidelines is much appreciated, as is your interest in the deliberations of the Evaluation Committee. If you have any question, please contact the undersigned at (800) 423-6587, extension 5685, or Mike Rhodebeck, Staff Engineer, at extension 5699. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,



Michael O'Reardon, P.E.
Regional Manager

MPO/raf

Enclosures

cc: Evaluation Committee



CraftMaster Manufacturing, Inc.
500 West Monroe Street, Suite 2010
Chicago, IL 60661-3762
312.382.8701 · Fax: 312.382.8704

March 5, 2010

Michael O'Reardon
ICC Evaluation Services
900 Montclair Rd
Suite A
Birmingham, AL 35213

Re: Response to public comments on the Proposed Acceptance Criteria for Wood-based Exterior Composite Trim Treated with ZB Preservative by a Non-pressure Process

Dear Mike,

In response to the Composite Panel Association's (CPA) objections relative to the development of a Wood Composite Trim ANSI Standard and the objection of Louisiana Pacific Corporation (LP) relative to ANSI 135.6 and the thickness criteria, CMI responds as follows:

1. The Acceptance Criteria development process is proprietary to the company proposing the AC. However, in an effort to be forthcoming with industry, CMI will volunteer to comment that the physical property limits and thickness of products identified in our draft AC are based on more than 12 years of production, internal quality assurance testing and field results.
2. The CPA's work to develop an ANSI-approved trim standard has proved unsuccessful for over 10 years. We also believe the likelihood of gaining industry consensus within the next year will continue to be very low. CMI does not wish to uphold the development of its AC any further by waiting for the CPA to resolve this process, which they have been unable to do thus far.
3. The standard that the CPA is hoping to develop for the entire group includes the traditional physical properties of hardboard trim, and does not meet current market requirements. Again, the standards set forth in our proposed AC have 12 years of field performance and acceptance.

In response to LP and the American Plywood Association's concerns regarding the zinc borate retention limit of 1.0% by weight, CMI responds as follows:

1. During the development of MiraTEC® Trim, our wood composite trim product, the 0.75% zinc borate retain level was recommended to us by our zinc borate supplier at the time, US Borax. It is also outlined in the product specifications published by US Borax: *"Borogard ZB Preservative for Wood Composites, Product Profile, z1998 U.S. Borax BT2-JJ1-82-US"*.
2. CMI has over 12 years of proven field performance with respect to rot and termite resistance. This is long before the American Wood Products Association (AWPA) began development of the T1 standard, cited in the APA's comments.
3. CMI has conducted two separate tests, both performed by third parties (Michigan Tech University and Louisiana State University) and each test lasting three years to verify the rot and termite resistance of MiraTEC Trim.

In response to LP's recommendation to rename the standard from Wood Composite to Lignocellulosic Fiber, CMI feels that this designation is both too narrow and limiting and could

easily be construed as misleading to the marketplace. Again, the AC proposed is proprietary to CMI.

In response to the APA's request to clarify that products covered under AC321 ("Treated-Engineered-Wood Siding") are outside the scope of Proposed AC424, CMI agrees.

In response to the APA's request to increase the number of trim laps to collect for cutting test specimen replicates to 10 laps per thickness, CMI agrees.

Sincerely,

Michael Steiber
Product Manager
CMI



ICC EVALUATION SERVICE, INC., RULES OF PROCEDURE FOR THE EVALUATION COMMITTEE

1.0 PURPOSE

The purpose of the Evaluation Committee is to monitor the work of ICC-ES, in issuing evaluation reports; to evaluate and approve acceptance criteria on which evaluation reports may be based; and to sponsor related changes in the applicable codes.

2.0 MEETINGS

2.1 The Evaluation Committee shall schedule meetings that are open to the public in discharging its duties under Section 1, subject to Section 3.

2.2 All scheduled meetings shall be publicly announced.

2.3 Two-thirds ($\frac{2}{3}$) of the voting Evaluation Committee members shall constitute a quorum. A majority vote of members present is required on any action.

2.4 In the absence of the nonvoting chairman-moderator, Evaluation Committee members present shall elect an alternate chairman from the committee for that meeting. The alternate chairman shall be counted as a voting committee member for purposes of maintaining a committee quorum and to cast a tie-breaking vote of the committee.

2.5 Minutes of the meetings shall be kept.

2.6 An electronic audio record of meetings shall be made by ICC-ES; no other audio, video, electronic or stenographic recordings of the meetings will be permitted. Visual aids (including, but not limited to, charts, overhead transparencies, slides, videos, or presentation software) viewed at meetings shall be permitted only if the presenter provides ICC-ES before presentation with a copy of the visual aid in a medium which can be retained by ICC-ES with its record of the meeting and which can also be provided to interested parties requesting a copy. A copy of the ICC-ES recording of the meeting and such visual aids, if any, will be available to interested parties upon written request made to ICC-ES together with a payment as required by ICC-ES to cover costs of preparation and duplication of the copy. These materials will be available beginning five days after the conclusion of the meeting but will no longer be available after one year from the conclusion of the meeting.

2.7 Parties interested in the deliberations of the committee should refrain from communicating, whether in writing or verbally, with committee members regarding agenda items. All written communications and submissions regarding agenda items should be delivered to ICC-ES. All such written communications and submissions shall be considered nonconfidential and available for discussion in open session of an Evaluation Committee meeting, and shall be delivered at least ten days before the scheduled Evaluation Committee meeting if they are to be forwarded to the committee. Materials delivered to ICC-ES at least ten

days before the scheduled meeting will be posted on the ICC-ES web site (www.icc-es.org) prior to the meeting. After this time, parties wishing to submit materials for consideration by the Evaluation Committee must deliver a sufficient number of copies as directed by ICC-ES. Consideration of materials not received by ICC-ES at least ten days before the meeting is at the discretion of the Evaluation Committee. Following the meeting, ICC-ES will make all materials considered by the Evaluation Committee available on the web site for a maximum period of one year following the meeting. The committee reserves the right to refuse recognition of communications which do not comply with the provisions of this section.

3.0 CLOSED SESSIONS

Evaluation Committee meetings shall be open except that the chairman may call for a closed session to seek advice of counsel.

4.0 ACCEPTANCE CRITERIA

4.1 Acceptance criteria are established by the committee to provide a basis for issuing ICC-ES evaluation reports on products and systems under codes referenced in Section 2.0 of the Rules of Procedure for Evaluation Reports. They also clarify conditions of acceptance for products and systems specifically regulated by the codes.

Acceptance criteria may involve a product, material, method of construction, or service. Consideration of any acceptance criteria must be in conjunction with a current and valid application for an ICC-ES evaluation report, an existing ICC-ES evaluation report, or as otherwise determined by the Evaluation Committee.

4.2 Procedure:

4.2.1 Proposed acceptance criteria shall be developed by the ICC-ES staff and discussed in open session with the Evaluation Committee during a scheduled meeting, except as permitted in Section 5.0 of these rules.

4.2.2 Proposed acceptance criteria shall be available to interested parties at least 30 days before discussion at the committee meeting.

4.2.3 The committee shall be informed of all pertinent written communications received by ICC-ES.

4.2.4 Attendees at Evaluation Committee meetings shall have the opportunity to speak on acceptance criteria listed on the meeting agenda, to provide information to committee members.

4.3 Approval of acceptance criteria shall be as specified in Section 2.3 of these rules.

4.4 Actions of the Evaluation Committee may be

ICC EVALUATION SERVICE, INC., RULES OF PROCEDURE FOR THE EVALUATION COMMITTEE

appealed in accordance with the ICC-ES Rules of Procedure for Appeal of Acceptance Criteria or the ICC-ES Rules of Procedure for Appeals of Evaluation Committee Technical Decisions.

5.0 COMMITTEE BALLOTING FOR ACCEPTANCE CRITERIA

5.1 Acceptance criteria may be issued without a public hearing following a 30-day public comment period and a majority vote for approval by the Evaluation Committee when, in the opinion of ICC-ES staff, one or more of the following conditions have been met:

1. The subject is nonstructural, does not involve life safety, and is addressed in nationally recognized standards or generally accepted industry standards.
2. The subject is a revision to an existing acceptance criteria that requires a formal action by the Evaluation Committee, and public comments raised were resolved by staff with commenters fully informed.
3. Other acceptance criteria and/or the code provide precedence for the revised criteria.

5.2 Negative votes must be based upon one or more of the following, for the ballots to be considered valid and require resolution:

- a. *Lack of clarity:* There is insufficient explanation of the scope of the acceptance criteria or insufficient description of the intended use of the product or system; or the acceptance criteria is so unclear as to be unacceptable. (The areas where greater clarity is required must be specifically identified.)
- b. *Insufficiency:* The criteria is insufficient for proper evaluation of the product or system. (The provisions of the criteria that are in question must be specifically identified.)
- c. *The subject of the acceptance criteria is not within the scope of the applicable codes:* A report issued by ICC-ES is intended to provide a basis for approval under the codes. If the subject of the acceptance criteria is not regulated by the codes, there is no basis for issuing a report, or a criteria. (Specifics must be provided concerning the inapplicability of the code.)

d. *The subject of the acceptance criteria needs to be discussed in a public hearings.* The committee member requests additional input from other committee members, staff or industry.

5.3 An Evaluation Committee member, in voting on an acceptance criteria, may only cast the following ballots:

- Approved
- Approved with Comments
- Negative: Do Not Proceed

6.0 COMMITTEE COMMUNICATION

Direct communication between committee members, and between committee members and an applicant or concerned party, with regard to the processing of a particular acceptance criteria or evaluation report shall take place only in a public hearing of the Evaluation Committee. Accordingly:

6.1 Committee members receiving an electronic ballot should respond only to the sender (staff). Committee members who wish to discuss a particular matter with other committee members, before reaching a decision, should ballot accordingly and bring the matter to the attention of ICC-ES staff, so the issue can be placed on the agenda of a future committee meeting.

6.2 Committee members who are contacted by an applicant or concerned party on a particular matter that will be brought to the committee will refrain from private communication and will encourage the applicant or concerned party to forward their concerns through the ICC-ES staff in writing, and/or make their concerns known by addressing the committee at a public hearing, so that their concerns can receive the attention of all committee members.■

Effective March 18, 2008

PROPOSED ACCEPTANCE CRITERIA FOR WOOD-BASED EXTERIOR COMPOSITE TRIM TREATED WITH ZINC BORATE (ZB) PRESERVATIVE BY A NON-PRESSURE PROCESS

AC424

Proposed May 2010

PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*® reads as follows:

The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria proposed in this document, and otherwise meet the applicable performance requirements of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria proposed in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise meet the applicable performance requirements of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

Acceptance criteria are developed for use solely by ICC-ES for purposes of issuing ICC-ES evaluation reports.

**PROPOSED ACCEPTANCE CRITERIA FOR WOOD-BASED EXTERIOR
COMPOSITE TRIM TREATED WITH ZINC BORATE (ZB) PRESERVATIVE BY A
NON-PRESSURE PROCESS**

1 **1.0 INTRODUCTION**

2 **1.1 Purpose:** The purpose of this acceptance criteria is to establish requirements for
3 wood-based exterior composite trim treated with zinc borate (ZB) preservative by a non-
4 pressure process to be recognized in an ICC Evaluation Service, Inc. (ICC-ES),
5 evaluation report under the 2009 *International Building Code*[®] (IBC) and the 2009
6 *International Residential Code*[®] (IRC). Bases of recognition are IBC Section 104.11 and
7 IRC Section R104.11. Applicable code sections are IBC Sections 1401 (Exterior Walls
8 – General), 1403 (Performance Requirements), 1404 (Materials), 2303.1.8
9 (Preservative-treated Wood), and 2304.11 (Protection against Decay and Termites);
10 and IRC Sections R317 (Protection of Wood and Wood Based Products against Decay),
11 R318 (Protection against Subterranean Termites), R701 (Wall Covering –General), and
12 R703 (Exterior Covering).

13 The reason for the development of this criteria is to allow the evaluation of wood-
14 based exterior composite trim treated with ZB preservative by a non-pressure process,
15 since the codes do not provide standards for evaluation of preservative-treated exterior
16 trim.

17 **1.2 Scope:** Wood-based exterior composite trim treated with ZB preservative by a
18 non-pressure process is used as nonload-bearing architectural trim and door and
19 window trim on buildings of combustible, nonfire-resistance-rated construction, IBC
20 Type VB, and all construction types permitted under the IRC. The trim is installed over

21 solid backing material, either approved exterior sheathing or approved exterior wall
22 coverings. Products covered under AC321 are outside the scope of this criteria.

23 **1.3 Codes and Referenced Standards:**

24 **1.3.1 Codes:**

25 **1.3.1.1** 2009 *International Building Code*[®] (IBC), International Code Council

26 **1.3.1.2** 2009 *International Residential Code*[®] (IRC), International Code Council

27 **1.3.2 American Wood Protection Association (AWPA) Standards:**

28 **1.3.2.1** 2009 AWPA Book of Standards[®].

29 **1.3.2.2** AWPA U1-09[®], *Commodity Specification J: Nonpressure Composites.*

30 **1.3.2.3** AWPA T1-09[®], *Section J: Nonpressure Composites.*

31 **1.3.2.4** AWPA A2-09[®], Standard Methods for Analysis of Waterborne Preservatives
32 and Fire-retardant Formulations.

33 **1.3.2.5** AWPA A9-08[®], Standard Method for Analysis of Treated Wood and Treating
34 Solutions by X-Ray Spectroscopy.

35 **1.3.3 ASTM International Standards:**

36 **1.3.3.1** ASTM D 4442 - 07, Standard Test Methods for Direct Moisture Content
37 Measurement of Wood and Wood-Base Materials.

38 **1.3.3.2** ASTM D 1037 - 06a, Standard Test Methods for Evaluating Properties of
39 Wood-Base Fiber and Particle Panel Materials.

40 **1.3.4** ANSI A135.6 - 2006, American National Standard, Hardboard Siding,
41 Composite Panel Association, American National Standards Institute.

42 **1.3.5** ICC-ES Acceptance Criteria for Zinc Borate (ZB) Preservative Treatment of
43 Structural Composite Lumber by Non-pressure Processes (AC203).

44 **1.3.6** ICC-ES Acceptance Criteria for Proprietary Wood Preservative
45 Systems—Common Requirements for Treatment Process, Test Methods and
46 Performance (AC326).

47 **1.4 Definitions:**

48 **1.4.1 Wood-based Exterior Composite Trim Treated with Zinc Borate (ZB)**

49 **Preservative by a Non-pressure Process:** The wood-based exterior composite trim
50 treated with ZB preservative by a non-pressure process is a wood composite treated
51 with zinc-borate in a non-pressure process. The trim is formed into boards, with smooth
52 or textured surfaces, in thicknesses of ¾ inch and 1 inch (19 mm and 25.4 mm)
53 [industry nomenclature 4/4 and 5/4]. The trim can be cut and machined with standard
54 woodworking tools and attached to the structure with nails or screws.

55 **1.4.2 Lap:** When the term lap or laps is used in this criteria, it refers to a length of
56 trim typically 16 feet (4.8 m) long. The width of lap is between 2 inches (51 mm) and 16
57 inches (406 mm).

58 **2.0 BASIC INFORMATION**

59 **2.1 General:** The following information shall be submitted:

60 **2.1.1 Product Description:** Complete information concerning material
61 specifications, thickness, size and the manufacturing process.

62 **2.1.2 Installation Instructions:** Installation details and limitations, fastening
63 methods, joint treatments and face treatments.

64 **2.1.3 Packaging and Identification:** A description of the method of packaging and
65 field identification of the ZB preservative-treated exterior wood fiber composite trim.

66 Identification provisions shall include the evaluation report number and the name or logo
67 of the inspection agency.

68 **2.1.4 Field Preparation:** A description of the methods of field-cutting, application
69 and finishing.

70 **2.2 Testing Laboratories:** Testing laboratories shall comply with Section 2.0 of the
71 ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES
72 Rules of Procedure for Evaluation Reports.

73 **2.3 Test Reports:** Test reports shall comply with AC85.

74 **2.4 Product Sampling:** Sampling of the ZB preservative-treated exterior wood fiber
75 composite trim for tests under this criteria shall comply with Section 3.1 of AC85.

76 **3.0 TEST AND PERFORMANCE REQUIREMENTS**

77 **3.1 Structural Performance—Transverse Wind Loads:** Wood-based exterior
78 composite trim treated with ZB preservative by a non-pressure process is not to be used
79 as a structural material and has no structural performance requirements, except for
80 transverse wind loads. A structural analysis shall be submitted evaluating the nail-head
81 pull-through testing (see Sections 3.2.3 and 4.2), to determine allowable negative
82 transverse wind load capacities. The allowable load capacities will be included in the
83 final evaluation report, with descriptions of the assemblies including number, size, type
84 and spacing of fasteners.

85 **3.2 Physical and Mechanical Properties:** Wood-based exterior composite trim
86 treated with ZB preservative by a non-pressure process shall meet the physical and
87 mechanical property performance requirements of Sections 3.2.1 through 3.2.7.

88 **3.2.1 Thickness Swelling:** The thickness swelling shall be tested in accordance
89 with the test procedures specified in Section 4.1, and shall conform to the specification
90 limit set forth in Table 2.

91 **3.2.2 Water Absorption:** The water absorption shall be tested in accordance with
92 the test procedures specified in Section 4.1, and shall conform to the specification limit
93 set forth in Table 2.

94 **3.2.3 Nail-head Pull-through:** The nail-head pull-through shall be tested in
95 accordance with Section 4.2, and shall conform to the specification limit set forth in
96 Table 2.

97 **3.2.4 Lateral Nail Resistance:** The lateral nail resistance shall be tested in
98 accordance with Section 4.3, and shall conform to the specification limit set forth in
99 Table 2.

100 **3.2.5 Modulus of Rupture:** The modulus of rupture shall be tested in accordance
101 with Section 4.4, and shall conform to the specification limit set forth in Table 2.

102 **3.2.6 Hardness:** The hardness shall be tested in accordance with Section 4.5, and
103 shall conform to the specification limit set forth in Table 2.

104 **3.2.7 Impact:** The impact resistance shall be tested in accordance with Section 4.6,
105 and shall conform to the specification limit set forth in Table 2.

106 **3.3 Durability:** Wood-based exterior composite trim treated with ZB preservative by
107 a non-pressure process shall comply with the durability performance requirements
108 specified in Sections 3.3.1 through 3.3.5.

109 **3.3.1 Accelerated Aging:** The accelerated aging percent thickness swell and
110 percent strength retention shall be tested in accordance with Section 4.7, and shall
111 conform to the specification limit set forth in Table 2.

112 **3.3.2 Weatherability of Substrate:** The weatherability of substrate percent residual
113 thickness swell shall be tested in accordance with Section 4.8, and shall conform to the
114 specification limit set forth in Table 2.

115 **3.3.3 Decay and Termite Resistance:** Testing for termite and decay resistance
116 shall be in accordance with Section 4.9.

117 **3.3.4 Minimum Retention:** The percent retained of zinc borate shall be tested in
118 accordance with Section 4.10, and shall conform to the specification limit set forth in
119 Table 2.

120 **3.3.5 Thickness Tolerances:** The thickness tolerances for the various nominal
121 thicknesses of the trim are set forth in Table 1.

122 **3.4 Moisture Content:** The moisture content at time of sampling at the
123 manufacturing site and at time of testing shall be determined by the testing procedures
124 described in Section 4.11, and shall conform to the specification limits set forth in Table
125 2 .

126 **3.5 Corrosion of Metals and Fasteners:** Evaluation to determine the corrosion of
127 metals and fasteners in contact with the wood-based exterior composite trim treated
128 with ZB preservative by a non-pressure process shall be in accordance with Section
129 4.12.

130 **4.0 TEST METHODS**

131 **4.1 Thickness Swelling and Water Absorption:** Thickness swelling and water
132 absorption testing shall comply with Method B of Section 23 of ASTM D 1037, with the
133 following amendments:

134 **4.1.1 Number of Tests:** ~~At least three~~ A minimum of ten nominally 12-inch-wide
135 laps of nominally 5/4 trim, and ~~at least three~~ a minimum of ten nominally 12-inch-wide
136 (305 mm) laps of nominally 4/4 trim, shall be tested. One test specimen shall be cut
137 from each lap.

138 **4.1.2 Test Specimen Cutting Location:** From each nominally 12-inch-wide lap, the
139 cutting of the test specimen shall conform to “Figure 2. Test Specimen Cutting Diagram
140 – Lap Siding,” in ANSI A135.6.

141 **4.1.3 Test Specimen Dimensions:** The test specimens as cut in accordance with
142 ANSI A135.6 shall be 12 inches (305 mm) in length by the actual width of the nominally
143 12-inch lap.

144 **4.2 Nail-head Pull-through:** Nail-head pull-through testing shall comply with
145 Section 15 of ASTM D 1037, with the following amendments:

146 **4.2.1 Number of Tests:** ~~At least three~~ A minimum of ten nominally 12-inch-wide
147 laps of 5/4 trim, and ~~at least three~~ a minimum of ten nominally 12-inch-wide laps of 4/4
148 trim, shall be tested. Three test specimens shall be cut from each lap.

149 **4.2.2 Test Specimen Cutting Location:** From each nominally 12-inch-wide lap, the
150 cutting of the test specimen shall conform to “Figure 2 - Test Specimen Cutting Diagram
151 – Lap Siding,” in ANSI A135.6 .

152 **4.2.3 Test Specimen Dimensions:** Nail-head pull-through test specimen
153 dimensions shall conform to the dimensions specified in “Figure 2 - Test Specimen
154 Cutting Diagram – Lap Siding,” in ANSI A135.6 .

155 **4.2.4 Conformance to ANSI A135.6 Test Modifications:** Specimens shall be
156 tested in the dry condition. Three 6-penny [0.113 inch (2.9 mm) wire diameter] common
157 nails shall be used per specimen. The nails shall be driven into the specimen at least 1
158 inch (25 mm) apart. The holding fixture shall consist of a plate with a 1½-inch-diameter
159 (38 mm) opening centered in it, and the speed of testing shall be at a rate of 0.125 –
160 0.175 inch (3.2 – 4.5 mm) per minute. For embossed products, thickness should be
161 disregarded.

162 **4.3 Lateral Nail Resistance:** Lateral nail resistance testing shall comply with
163 Section 13 of ASTM D 1037, with the following amendments:

164 **4.3.1 Number of Tests:** ~~At least three~~ A minimum of ten nominally 12-inch-wide
165 laps of 5/4 trim, and ~~at least three~~ a minimum of ten nominally 12-inch-wide laps of 4/4
166 trim, shall be tested. Three test specimens shall be cut from each lap.

167 **4.3.2 Test Specimen Cutting Location:** From each nominally 12-inch-wide lap, the
168 cutting of the test specimen shall conform to “Figure 2 - Test Specimen Cutting Diagram
169 – Lap Siding,” in ANSI A135.6.

170 **4.3.3 Test Specimen Dimensions:** Nail-head pull-through test specimen
171 dimensions shall conform to the dimensions specified in “Figure 2 - Test Specimen
172 Cutting Diagram – Lap Siding,” in ANSI A135.6.

173 **4.3.4 Conformance to ANSI A135.6 Test Modifications:** Specimens shall be
174 tested in the dry condition. One 8-penny, 0.131-inch-diameter (3.3 mm) nail shall be

175 used per specimen, spaced $\frac{3}{8}$ inch (9.5 mm) from any specimen edge. Galvanized
176 nails may bend; therefore, a steel carding pin or steel drill rod of the same diameter is
177 recommended. Testing speed shall be 0.125 – 0.175 inch (3.2 – 4.5 mm) per minute.
178 For embossed products, thickness should be disregarded.

179 **4.4 Modulus of Rupture:** Modulus of Rupture testing shall comply with Section 9 of
180 ASTM D 1037, with the following amendments:

181 **4.4.1 Number of Tests:** ~~At least three~~ A minimum of ten nominally 12-inch-wide
182 laps of 5/4 trim, and ~~at least three~~ a minimum of ten nominally 12-inch-wide laps of 4/4
183 trim, shall be tested. Two test specimens shall be cut from each lap.

184 **4.4.2 Test Specimen Cutting Location:** From each nominally 12-inch-wide lap, the
185 location for cutting of the test specimens shall conform to “Figure 2 - Test Specimen
186 Cutting Diagram – Lap Siding,” in ANSI A135.6. Only the MOR test specimens that are
187 shown running parallel to the length of the lap shall be cut, and the dimensional
188 requirements for the MOR test specimens that are in Figure 2 of ANSI A135.6 shall be
189 ignored. (See Section 4.5.3 of this criteria for required dimensions).

190 **4.4.3 Test Specimen Dimensions:** For 4/4 trim, the test specimens shall be 3
191 inches (76 mm) wide by 20 inches (508 mm) long. For 5/4 trim, the test specimens
192 shall be 3 inches (76 mm) wide by 26 inches (660 mm) long.

193 **4.5 Hardness:** Hardness testing shall comply with Section 9 of ASTM D 1037, with
194 the following amendments:

195 **4.5.1 Number of Tests:** ~~At least three~~ A minimum of ten nominally 12-inch-wide
196 laps of 5/4 trim, and ~~at least three~~ A minimum of ten nominally 12-inch-wide laps of 4/4
197 trim, shall be tested. Two test specimens shall be cut from each lap.

198 **4.5.2 Test Specimen Cutting Location:** From each nominally 12-inch-wide lap, the
199 cutting of the test specimen shall conform to “Figure 2 - Test Specimen Cutting Diagram
200 – Lap Siding,” in ANSI A135.6.

201 **4.5.3 Test Specimen Dimensions:** Hardness test specimen dimensions shall
202 conform to the dimensions specified in “Figure 2 - Test Specimen Cutting Diagram –
203 Lap Siding,” in ANSI A135.6.

204 **4.5.4 Conformance to ANSI A135.6 Test Modifications:** The test is conducted on
205 the back (unembossed) face only. The test is not conducted on the embossed face.

206 **4.6 Impact:** Impact testing shall comply with Section 21 of ASTM D 1037, with the
207 following amendments:

208 **4.6.1 Number of Tests:** ~~At least three~~ A minimum of ten nominally 12-inch-wide
209 laps of 5/4 trim, and ~~at least three~~ a minimum of ten nominally 12-inch-wide laps of 4/4
210 trim, shall be tested. Two test specimens shall be cut from each lap.

211 **4.6.2 Test Specimen Cutting Location:** From each nominally 12-inch-wide lap, the
212 cutting of the test specimen shall conform to “Figure 2 - Test Specimen Cutting Diagram
213 – Lap Siding,” in ANSI A135.6.

214 **4.6.3 Test Specimen Dimensions:** Impact test specimens shall be 9 inches (229
215 mm) in length by the actual width of the nominally 12-inch-wide lap.

216 **4.6.4 Conformance to ANSI A135.6 Test Modifications:** The initial drop shall be
217 made from 9 inches (225 mm). Failure shall be when a visible fracture occurs at the
218 bottom surface of the specimen.

219 **4.7 Accelerated Aging:** Accelerated Aging testing shall comply with Section 7 of
220 ASTM D 1037, with the following amendments

221 **4.7.1 Number of Tests:** ~~At least three~~ A minimum of ten nominally 12-inch-wide
222 laps of 5/4 trim, and ~~at least three~~ a minimum of ten nominally 12-inch-wide laps of 4/4
223 trim, shall be tested. Four test specimens shall be cut from each lap. Two of the test
224 specimens from each lap will be controls (not exposed to accelerated aging) and two of
225 the test specimens from each lap will be exposed to the conditions of accelerated aging.

226 **4.7.2 Test Specimen Cutting Location:** All four test specimens shall be cut parallel
227 to the lap length direction. After cutting all other test specimens required by this
228 acceptance criteria, the accelerated aging test specimens shall be cut anywhere from
229 the remaining length of the laps.

230 **4.7.3 Test Specimen Dimensions:** For 4/4 trim, the test specimens shall be 3
231 inches (76 mm) wide by 20 inches (508 mm) long. For 5/4 trim, the test specimens
232 shall be 3 inches (76 mm) wide by 26 inches (660 mm) long.

233 **4.7.4 Properties of Interest from the Accelerated Aging Test:**

234 **4.7.4.1** Thickness swelling.

235 **4.7.4.2** Modulus of rupture percent strength retention.

236 **4.7.5 Modulus of Rupture Percent Strength Retention:** The aged MOR or the
237 MOR after treatment in the exposure cycles of this test method is to be calculated
238 based on the dimensions and mass of the same specimens before treatment ~~of the dry~~
239 ~~specimens (before treatment)~~. The percent strength retention is the aged MOR divided
240 by the dry untreated control specimen MOR ~~(the samples that were not subject to the 6-~~
241 ~~cycle aging treatment)~~ times 100.

242 **4.8 Weatherability of Substrate:** Weatherability of substrate testing shall comply
243 with Section 4.1 of ANSI A135.6, with the following amendments:

244 **4.8.1 Number of Tests:** ~~At least three~~ A minimum of ten nominally 12-inch-wide
245 laps of 5/4 trim, and ~~at least three~~ a minimum of ten nominally 12-inch-wide laps of 4/4
246 trim, shall be tested. Two test specimens shall be cut from each lap.

247 **4.8.2 Test Specimen Cutting Locations:** From each nominally 12-inch-wide lap,
248 the cutting of the test specimen shall conform to “Figure 2 - Test Specimen Cutting
249 Diagram – Lap Siding,” in ANSI A135.6.

250 **4.8.3 Conformance to ANSI A135.6 Test Modifications:** The thickness is
251 measured at a spot of no slope or minimal slope.

252 **4.9 Decay and Termite Resistance:** Testing shall be in accordance with Sections
253 4.1 to 4.4 of AC326 and shall document a service condition of AWPA UC3A, coated
254 millwork, siding and trim exposed to all weather cycles, not exposed to prolonged
255 wetting. An analysis of the test data shall be provided in accordance with Section 4.8 of
256 AC326.

257 **4.10 Minimum Retention of Zinc Borate (ZB):** The retention of ZB shall be
258 determined by one of the following methods:

259 (1) Determination of boron shall be in accordance with AWPA Standard A2,
260 Section 16.

261 (2) Determination of zinc shall be performed using energy dispersive x-ray
262 fluorescence (ED-XRF), as described in AWPA Standard A9.

263 ~~At least three~~ A minimum of ten nominally 12-inch-wide laps of 5/4 trim, and ~~at~~
264 ~~least three~~ a minimum of ten nominally 12-inch-wide laps of 4/4 trim, shall be tested.

265 Two test specimens shall be cut from each lap. The test specimens may be cut

266 anywhere on the laps after all other test specimens for the other tests have been
267 removed.

268 **4.11 Moisture Content:** Moisture content testing shall comply with Method B of
269 ASTM D 442.

270 **4.12 Corrosion of Metals and Fasteners:** Evaluation for corrosion of metals and
271 fasteners in contact with wood-based exterior composite trim treated with ZB
272 preservative by a non-pressure process shall be in accordance with Section 4.6 of
273 AC326. An analysis of the test data shall be provided in accordance with Section 4.8 of
274 AC326. The analysis shall define the types of metals and fasteners that may be in
275 contact with the ZB treated trim.

276 **5.0 QUALITY CONTROL**

277 **5.1** The products shall be manufactured under an approved quality control program
278 with inspections by an agency accredited by the International Accreditation Service
279 (IAS) or otherwise acceptable to ICC-ES.

280 **5.2** Quality documentation complying with the ICC-ES Acceptance Criteria for Quality
281 Documentation (AC10) shall be submitted.

282 **6.0 EVALUATION REPORT RECOGNITION**

283 The following conditions of use shall be included in the evaluation report for wood-
284 based exterior composite trim treated with zinc borate preservative by a non-pressure
285 process:

286 **6.1** [Product trade name] trim shall be used only as a nonload-bearing exterior trim.

287 **6.2** [Product trade name] trim shall be limited to combustible, nonfire-resistance-
288 rated construction, IBC Type VB, and all construction types permitted under the IRC.

PROPOSED ACCEPTANCE CRITERIA FOR
WOOD-BASED EXTERIOR COMPOSITE TRIM
TREATED WITH ZINC BORATE (ZB) PRESERVATIVE
BY A NON-PRESSURE PROCESS

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- 289 The trim shall be installed over solid backing material, either approved exterior
290 sheathing or approved exterior wall coverings.
- 291 **6.3** [Product trade name] trim shall be limited to the exterior trim products, sizes and
292 dimensions that are listed in the evaluation report. ■

TABLE 1—THICKNESS SPECIFICATIONS FOR WOOD-BASED EXTERIOR COMPOSITE TRIM TREATED WITH ZINC BORATE (ZB) PRESERVATIVE BY A NON-PRESSURE PROCESS

NOMINAL THICKNESS, (inches)	MINIMUM,(inch), AVERAGE PER LAP ¹	MAXIMUM, (inch), AVERAGE PER LAP ¹
¾ (4/4)	0.725	0.775
1 (5/4)	0.965	1.015

For SI: 1 inch = 25.4 mm, 1 foot = 0.3 m

¹A lap is a length of trim typically 16 feet in length. The width of a lap is between 2 inches and 16 inches.

TABLE 2—PERFORMANCE REQUIREMENTS OF WOOD-BASED EXTERIOR COMPOSITE TRIM TREATED WITH ZINC BORATE (ZB) PRESERVATIVE BY A NON-PRESSURE PROCESS

PROPERTY	REQUIREMENT
Thickness Swelling, percent (maximum average per lap ¹).	5
Water Absorption, percent based upon weight (maximum average per lap ¹).	10
Nail-head pull through, lb (N) (minimum average per nail lap ¹).	150 (670)
Lateral Nail Resistance, lb (N) (minimum average per nail lap ¹).	150 (670)
Modulus of Rupture, psi (MPa) (minimum average per lap ¹).	1800 (12.4)
Hardness, lb (N) (minimum average per lap ¹).	450 (2000)
Impact, in (mm) (minimum average per lap ¹).	9 (225)
Accelerated Aging, percent thickness swell (maximum average per lap ¹).	6
Accelerated Aging, percent strength retention (minimum average per lap ¹).	70
Weatherability of Substrate, percent residual swell (maximum per lap ¹).	10
Decay Resistance, percent retained zinc borate (minimum per lap ¹).	0.75
Moisture Content, percent (per lap ¹).	4 to 9

¹A lap is a length of trim typically 16 feet in length. The width of a lap is between 2 inches and 16 inches. (For SI: 1 inch = 25.4 mm, 1 foot = 0.3 m.)