ICC EVALUATION SERVICE

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February 9, 2010

**TO:** **PARTIES INTERESTED IN EVALUATION REPORTS ON ZINC BORATE (ZB) PRESERVATIVE TREATMENT OF STRUCTRUAL COMPOSITE WOOD PRODUCT BY NON-PRESSURE PROCESSES**

**SUBJECT:** Revisions to the Acceptance Criteria for Zinc Borate (ZB) Preservative Treatment of Structural Composite Wood Products by Non-pressure Processes, Subject AC203-0210-R1 (MO/MR)

Dear Madam or Sir:

Enclosed is a copy of the subject revised acceptance criteria approved by the ICC-ES Evaluation Committee on February 2, 2010, effective March 1, 2010.

The subject criteria was revised to expand the scope to include any structural composite wood product, not just lumber, and to update the document to current codes and standards. Additional revisions were approved at the hearing to add references to the 2006 IBC and IRC, include reference to appropriate AWPA Use Categories UC1, UC2 and UC3A, and make editorial changes.

Evaluation reports issued on or after the effective date noted above, and falling within the scope of this criteria, will be required to comply with the enclosed edition of the criteria. Evaluation reports issued prior to the effective date may be in compliance either with the enclosed acceptance criteria or with the previous edition. Evaluation reports based on a superseded version of an acceptance criteria must be brought into compliance with the most recent edition at the time the reports are reissued. Therefore, applicants should submit data verifying compliance at the time they apply for re-examination.

If you have any questions, please contact Michael O'Reardon, at (800) 423-6587, extension 5685. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,

Gary G. Nichols

Gary Nichols, PE, SECB
Vice President

GGN/raf

Enclosure

cc: Evaluation Committee

ICC EVALUATION SERVICE

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# ACCEPTANCE CRITERIA FOR ZINC BORATE (ZB) PRESERVATIVE TREATMENT OF STRUCTURAL COMPOSITE WOOD PRODUCTS BY NON-PRESSURE PROCESSES

**AC203**

**Approved February 2010**

**Effective March 1, 2010**

**Previously approved December 2009, February 2006 and July 2002**

## 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.

This acceptance criteria has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the acceptance criteria. The criteria was developed and adopted following public hearings conducted by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from the previous edition, a solid vertical line (**I**) in the margin within the criteria indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (**➜**) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This criteria may be further revised as the need dictates.

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 set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features 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 if 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 purpose of issuing ICC-ES evaluation reports.***

# ACCEPTANCE CRITERIA FOR ZINC BORATE (ZB) PRESERVATIVE TREATMENT OF STRUCTURAL COMPOSITE WOOD PRODUCTS BY NON-PRESSURE PROCESSES (AC203)

## 1.0 INTRODUCTION

**1.1 Purpose:** The purpose of this acceptance criteria is to establish requirements for zinc borate (ZB) preservative treatment of structural composite wood products by a non-pressure process to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 and 2009 *International Building Code*® (IBC) and the 2006 and 2009 *International Residential Code*® (IRC). Bases of recognition are IBC Section 104.11 and IRC Section R104.11. Applicable code sections are 2006 and 2009 IBC Sections 2303.1.8 (Preservative-treated wood) and 2304.11 (Protection against decay and termites); and 2009 IRC Sections R317 (Protection of Wood and Wood Based Products against Decay) and R318 (Protection against Subterranean Termites); and 2006 IRC Sections R319 (Protection against Decay) and R320 (Protection against Subterranean Termites).

The reason for the development of the criteria is to provide a guideline for the evaluation of ZB preservative treatment of structural composite wood products, since the requirements in Section 2303.1.8 of the IBC, Sections R317 and R318 of the IRC, do not include requirements for the preservative treatment of structural composite wood products by non-pressure processes.

**1.2 Scope:** This acceptance criteria applies to ZB preservative treatment of structural composite wood products recognized in a current ICC-ES evaluation report. The ZB treated structural composite wood products are limited to locations that are above ground and protected from the weather (AWPA Use Category UC3A as defined in AWPA U1), although the products are permitted to be used as sill plates over concrete footings and slabs (AWPA Use Category UC2 as defined in AWPA U1). In-process treatment with ZB is a non-pressure treatment process.

**1.3 Codes and Referenced Standards:**

**1.3.1** 2009 *International Building Code*® (2009 IBC), International Code Council.

**1.3.2** 2006 *International Building Code*® (2006 IBC), International Code Council.

**1.3.3** 2009 *International Residential Code*® (2009 IRC), International Code Council.

**1.3.4** 2006 *International Residential Code*® (2009 IRC), International Code Council.

**1.3.5** 2009 AWPA Book of Standards©

**1.3.6** American Wood Protection Association (AWPA) Standards:

**1.3.6.1** AWPA U1-09©, *Commodity Specification J: Nonpressure Composites*

**1.3.6.2** AWPA T1-09©, *Section J: Nonpressure Composites*

**1.3.6.3** AWPA A2-09©, Standard Methods for Analysis of Waterborne Preservatives and Fire-retardant Formulations.

**1.3.6.4** AWPA A9-08©, Standard Method for Analysis of Treated Wood and Treating Solutions by X-Ray Spectroscopy.

**1.3.6.5** AWPA P18-07©, Nonpressure Preservatives.

**1.3.7** ICC-ES Acceptance Criteria for Quality Documentation (AC10).

**1.3.8** ICC-ES Acceptance Criteria for Test Reports and Product Sampling (AC85).

**1.3.9** ICC-ES Acceptance Criteria for Structural Wood-based Products (AC47).

**1.3.10** ICC-ES Acceptance Criteria for Treated-engineered-wood Siding (AC321).

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

**1.4 Definitions:**

**1.4.1 Zinc Borate (ZB):** Zinc borate is a sparingly soluble borate having the approximate composition $2ZnO \cdot 3B_2O_3 \cdot 3.5\ H_2O$, and formula weight 441.88. Zinc borate is described and recognized in AWPA Standard P18, Section 1.

**1.4.2 Structural Composite Wood Products:** Wood products recognized under AC47, AC321 or AWPA T1, Section J, Table J3.

## 2.0 BASIC INFORMATION

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

**2.1.1 Product Description:** Complete information concerning material specifications, compositions, formulations and manufacturing processes shall be provided.

**2.1.2 Packaging and Identification:** A description of the method of packaging and field identification of the ZB treated structural composite wood products. Identification provisions shall include the evaluation report number and, if applicable, the name or logo of the inspection agency. Also, each piece of structural composite wood product shall be legibly branded with, marked with, or otherwise have permanently affixed, the following information:

**2.1.2.1** Identity of the company and plant manufacturing the ZB treated structural composite wood products.

**2.1.2.2** Preservative symbol or name.

**2.1.2.3 End Use Limits:** Treated structural composite wood products are limited to locations that are above ground and protected from the weather, although the products can be used as sill plates installed over concrete slabs and foundations.

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

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

**2.4 Product Sampling:** Sampling of the ZB treated structural composite wood products for tests under this criteria shall comply with Section 3.1 of AC85.

## 3.0 TEST AND PERFORMANCE REQUIREMENTS

**3.1 General Requirements:** Information shall be submitted concerning the ability of the structural composite wood product to resist wood-destroying organisms. This information shall consider wood species, resin type and content, and method of production. The manufacturer of the structural composite wood products shall submit to ICC-ES data in accordance with AWPA U1 Commodity Specification J, AWPA T1 Section J, Appendix F of the AWPA Technical Committee Regulations as published in the AWPA Book of Standards and Sections 4.1 to 4.4 of AC326, The data submitted shall document a service condition of either AWPA UC1, UC2 or UC3A, as applicable.

Information regarding the effect the ZB treatment has on the physical and mechanical properties of the structural composite wood product shall be submitted.

**3.1.1** Preservative treatment of structural composite wood products with ZB shall be a part of the manufacturing process, in conjunction with the application of adhesive, polymer, or other additives to the wood elements before consolidation and pressing.

**3.1.2** Application of ZB shall be conducted on a mass/mass basis, expressed as a percentage of the weight of ZB to the weight of dry wood fiber.

**3.1.3** Zinc borate is permitted to be applied in a dry powder or water-based slurry form.

**3.1.4** Incising prior to treatment is not required.

**3.1.5** Kiln drying after treatment is not required.

**3.2 Results of Treatment:**

**3.2.1** Retention shall be determined by assay analysis of the treated structural composite wood product as described in Section 3.3 of this criteria.

**3.2.2** Minimum retention of ZB preservative in structural composite wood product shall comply with the following:

**3.2.2.1** For products complying with AC47, refer to Table 1 of this criteria.

**3.2.2.2** For products complying with AC321, refer to AWPA T1, Section J, Table J3,

**3.2.2.3** For products not recognized under AC47 or AC321, compliance shall be with AWPA T1, Section J, Table J3.

**3.3 ZB Determination Methods:** The retention of ZB shall be determined by one of the two following methods:

**3.3.1** Determination of boron in treated structural composite wood product shall be in accordance with AWPA Standard A2, Section 16.

**3.3.2** Determination of zinc in treated structural composite wood products shall be performed using energy dispersive x-ray fluorescence (ED-XRF), as described in AWPA Standard A9.

**3.4 Corrosion of Metals:** Evaluation for corrosion of metals shall be in accordance with Section 4.6 of AC326.

## 4.0 QUALITY CONTROL

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

**4.2** The manufacturing facility where the ZB treated structural composite wood products covered under AC47 are fabricated shall be audited by the approved independent inspection agency in accordance with the audit requirements specified in Appendix A of AC47.

**4.3** The manufacturing facility where the ZB treated structural composite wood products covered under AC321 are fabricated shall be inspected by the approved independent inspection agency in accordance with the inspection requirements specified in Section 5.0 of AC321.

**4.4** Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted. The quality documentation shall also comply with the applicable requirements of the AWPA Book of Standards. ■

**TABLE 1—AC47 PRODUCTS**

| | | |
|---|---|---|
| 1.0 Results of treatment for structural composite lumber: | | |
| 1.1 Retention shall be determined by assay analysis of the treated AC47 product | | |
| 1.1.1 Sampling frequency per billets produced | | |
| Less than 10 billets: | Sample from first billet. | |
| 10 to 40 billets: | Sample from first and last billet. | |
| 41 to 80 billets | Sample from first, 60th and 80th billet. | |
| Over 80 billets: | Sample from first, every 40th, and last billet. | |
| 1.1.2 Replicates per sampling frequency | 3 | |
| 1.1.3 Sampling zone for assay | Full cross section | |
| 1.2 Minimum sample retention of ZB preservative treatment in AC47 product, expressed as a percent of weight of ZB/weight of dry wood fiber[1] | Decay | Termites |
| | 0.75 percent | 0.90 percent |
| 1.3 Minimum penetration | Full cross section | |

[1]The tabulated retention level is a minimum for AC47 products. The manufacturer of the SCL product shall submit data in accordance with Section 3.1 of this acceptance criteria, to verify the minimum retention level for a SCL product manufactured with a known wood species, adhesive type, and manufacturing process.