ACCEPTANCE CRITERIA FOR WATERBORNE COPPER NAPHTHENATE WOOD-PRESERVATIVE TREATMENT SYSTEMS

AC242

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Effective January 1, 2007

Previously June 2004

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 (|) 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.

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1.0 INTRODUCTION

1.1 Purpose: The purpose of this criteria is to establish requirements for waterborne copper naphthenate wood preservative treatment of lumber, timbers, posts and plywood to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 International Building Code® (IBC), the 2006 International Residential Code® (IRC), the BOCA® National Building Code® (BNBC), the 1999 Standard Building Code® (SBC), and the 1997 Uniform Building Code™ (UBC). The bases of recognition are IBC Section 104.11, IRC Section R104.11, BNBC Section 106.4, SBC Section 103.7 and UBC Section 104.2.8. For applicable code sections, refer to AC326.

The reason for the development of this criteria is to evaluate a proprietary wood preservative for resistance to decay and termites, since there are no test methods and performance requirements for documenting resistance to decay and termites in Section 2304.11 of the IBC and Sections R319 and R320 of the IRC.

1.2 Scope: Sawn lumber, timbers, posts and plywood treated with waterborne copper naphthenate wood preservative treatment is used for aboveground, ground-contact, and aboveground decking use only. The ICC-ES Acceptance Criteria for Proprietary Wood Preservative Systems—Common Requirements for Treatment Process, Test Methods and Performance Requirements (AC326), shall be used for evaluating waterborne Copper-Azole wood preservative systems, except when noted otherwise in this criteria.

1.3 Codes and Referenced Standards: Where standards are referenced in this criteria, these standards shall be applied consistently with the code upon which compliance is based. Codes and standards are listed in Section 1.3 of AC326. Standards not listed in AC326 that are required for evaluation of waterborne copper naphthenate wood-preservative systems are listed below:

1.3.1 American Wood-Preservers’ Association (AWPA):

1.3.1.1 AWPA A2-06®, Standard Methods for Analysis of Waterborne Preservatives and Fire-Retardant Formulations.

1.3.1.2 AWPA A3-05®, Standard Methods for Determining Penetration of Preservatives and Fire Retardants.

1.3.1.3 AWPA A9-01®, Standard Method for Analysis of Treated Wood and Treating Solutions by X-Ray Spectroscopy.

1.3.1.4 AWPA A11-93®, Standard Method for Analysis of Treated Wood and Treating Solutions by Atomic Absorption Spectroscopy.

1.3.1.5 AWPA A21-00®, Standard Method for the Analysis of Wood and Wood Treating Solutions by Inductively Coupled Plasma Emission Spectrometry.

1.3.1.6 AWPA P8-03®, Standard for Oil-Borne Preservatives

1.3.2 ASTM International:

1.3.2.1 ASTM D1758-02, Standard Test Method of Evaluating Wood Preservatives by Field Tests with Stakes.

1.3.3 ICC-ES Acceptance Criteria

1.3.3.1 Acceptance Criteria for Quality Control Manuals (AC10).

1.3.3.2 Acceptance Criteria for Test Reports (AC85).

1.3.3.3 Acceptance Criteria for Proprietary Wood Preservative Systems—Common Requirements for Treatment Process, Test Methods and Performance (AC326).

1.4 Definitions:

1.4.1 Preservative Definition: Waterborne copper naphthenate preservative is a chemical produced by the reaction of copper compounds with naphthenic acid. The active ingredient is dissolved in a solution of an alkanolamine and/or ammonia in water. Naphthenic acid used in the manufacture of copper naphthenate is defined in AWPA P8.

1.4.2 Active Component (Nominal): The preservative concentrate shall have the following composition: Copper naphthenate, 42%, equivalent to 5% copper as metal.

1.4.3 Active Component, Minimum, Maximum: The active component present in the treating solution shall be within the following range:

<table>
<thead>
<tr>
<th>ACTIVE COMPONENT</th>
<th>MINIMUM PERCENT</th>
<th>MAXIMUM PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper naphthenate 5% Cu (concentrate only)</td>
<td>40</td>
<td>54</td>
</tr>
<tr>
<td>Copper naphthenate 2% Cu (brush-on application only)</td>
<td>16</td>
<td>21</td>
</tr>
<tr>
<td>Copper naphthenate 0.25-1% Cu (pressure treating [work tank concentration] only)</td>
<td>2</td>
<td>11</td>
</tr>
</tbody>
</table>

1.4.4 Preservative-Treated Wood: Refer to AC326.

2.0 BASIC INFORMATION

Basic information required for waterborne copper-azole wood-preservative systems shall be provided in accordance with Section 2.0 of AC326.

3.0 PRESERVATIVE TREATMENT PROCESS

3.1 General: General requirements for preservative treatment process shall be in accordance with Section 3.1 of AC326.

3.2 Treatment Standards:

3.2.1 Wood Preservative: The waterborne copper naphthenate preservative shall conform to the composition described in Section 1.4 of this criteria, and to applicable AWPA Analytical Standards as shown in Section 3.7 of this criteria.

3.2.2 Material: Wood species for lumber, timbers and posts shall be southern yellow pine, red pine, ponderosa pine, coastal Douglas fir, western hemlock, or hem-fir. Lumber to be labeled “Decking Use Only” shall be coastal Douglas fir, western hemlock, or hem-fir, and shall not exceed a nominal thickness of 2 inches (51 mm) and a nominal width of 6 inches (152 mm). Plywood shall be Exterior or Exposure 1. Only the following species and grade classifications may be used:
1. Southern yellow pine face veneers, Group 1 or 2; no hardwood core veneers.
2. Coastal Douglas fir face veneers, Group 1 or 2; no hardwood core veneers.

3.2.3 Physical Quality: Physical quality of treated lumber and plywood shall be in accordance with Section 3.2.3 of AC326.

3.2.4 Incising: Incising of lumber shall be in accordance with Section 3.2.4 of AC326.

3.3 Treatment Process: Treatment process shall be in accordance with Section 3.3 of AC326.

3.4 Results of Treatment: Results of treatment shall be in accordance with Section 3.4 of AC326.

3.4.1 Sampling Method: Sampling shall be in accordance with Section 3.4.1 of AC326.

3.4.2 Retention by Assay:

3.4.2.1 Above Ground: Retentions for above ground shall not be less than 0.07 pcf (1.12 kg/m³) copper as metal. Assay zones shall be the same as shown in AWPA Commodity Standards for CCA, ACQ, CBA, CA-B or ACZA. The retention by assay shall be determined using the analytical standards specified in Section 3.7 of this criteria.

3.4.2.2 Above Ground—Decking Use Only: Penetration for Douglas fir, western hemlock, and hem-fir “Decking Use Only” material shall be 0.20 inch (5.0 mm) and 90 percent of sapwood, and shall be measured on any incised surface. Minimum retentions for aboveground-decking use only shall be not less than 0.11 pcf (1.76 kg/m³) copper as metal. The retention by assay shall be determined using the analytical standards specified in Section 3.5 of this criteria.

3.4.2.3 Ground Contact: Retentions for ground contact shall not be less than 0.11 pcf (1.76 kg/m³) copper as metal. Assay zones shall be the same as those shown in AWPA standards. The retention by assay shall be determined using the analytical standards specified in Section 3.5 of this criteria.

3.4.2.4 Standard Density for Assay Calculation (AWPA Standard A 12):

3.4.2.4.1 Lumber, Timbers or Posts:
- Southern yellow pine—32 pcf (512 kg/m³)
- Red pine—26 pcf (416 kg/m³)
- Ponderosa pine—24 pcf (384 kg/m³)
- Douglas fir—28 pcf (448 kg/m³)
- Western hemlock—26 pcf (416 kg/m³)
- Hem-fir—24 pcf (384 kg/m³)

3.4.2.4.2 Plywood:
- Southern yellow pine—33 pcf (528 kg/m³)
- Douglas fir—33 pcf (528 kg/m³)

3.4.3 Penetration: Penetration shall be in accordance with Section 3.4.3 of AC326.

3.5 Drying after Treatment: Drying after treatment shall be in accordance with Section 3.5 of AC326.

3.6 Marking: Marking shall be in accordance with Section 3.6 of AC326.

3.7 Analysis Standards:
For copper, use one of the following:
- AWPA Standard A9: X-ray Fluorescence Spectroscopy
- AWPA Standard A11: Atomic Absorption Spectroscopy
- AWPA Standard A21: Inductively Coupled Plasma Spectroscopy

For determining penetration of copper naphthenate, use the following: AWPA Standard A3 (Section 2): Method for Determining Penetration of Copper-Containing Preservatives.

4.0 TEST METHODS AND PERFORMANCE REQUIREMENTS

The performance characteristics of the wood preservatives listed in this acceptance criteria shall be documented by testing. Testing shall be in accordance with AWPA and ASTM Standards. The wood-preservative products listed in this acceptance criteria shall demonstrate resistance to rot and fungal decay; and resistance to subterranean termites.

The following documentation is needed to substantiate the performance characteristics of the wood-preservative products listed in this acceptance criteria:

4.1 Laboratory Tests: Testing shall be in accordance with Section 4.1 of AC326.

4.2 Simulated Field Tests: Testing shall be in accordance with Section 4.2 of AC326.

4.3 Field Tests: Testing shall be in accordance with Section 4.3.3 of AC326.

4.4 Preservative Permanence: Testing indicated in Sections 4.4.1 and 4.4.2 shall be performed for ground-contact use; testing in Section 4.4.3 shall be performed for aboveground unprotected use of products labeled “Decking Use Only.”

Conditions of Acceptance: Testing shall demonstrate the level of use recommended for the product.

4.4.1 Refer to Section 4.4.1 of AC326.
4.4.2 Refer to Section 4.4.2 of AC326.
4.4.3 Treated products used out of ground contact and labeled “Decking Use Only” are tested in accordance with AWPA E9 or AWPA E16.

4.5 Effects on Wood Properties: Testing shall be in accordance with Section 4.5 of AC326.

Special use with truss plates when noted in the applicant’s literature must also be documented by testing for lateral resistance, tooth holding, and grip strength retention of truss plate connectors.

4.6 Corrosion: Testing shall be in accordance with Section 4.6 of AC326.

4.7 Treatment Testing: Testing shall be in accordance with Section 4.7 of AC326.

5.0 QUALITY CONTROL

Quality control shall be in accordance with Section 5.0 of AC326.

6.0 EVALUATION REPORT RECOGNITION

Conditions of use shall be in accordance with Section 6.0 of AC326.