

## **APPENDIX A: DATA REQUIREMENT GUIDELINES FOR LISTING WOOD PRESERVATIVES IN THE AWPA STANDARDS**

Maintained by Subcommittee P-1

This Appendix to AWPA's Technical Committee Regulations is not an AWPA Standard. It is a non-mandatory guidelines document presented to enable the user to understand the basic testing requirements for wood protection systems and to assist the AWPA Technical Committees in the development of AWPA Standards. The testing of products in accordance with this Appendix does not constitute conformance with any AWPA Standard. No product can be considered to conform with an AWPA Standard until it has been subjected to complete technical review and voting by AWPA's Technical Committees, and procedural review and final action by the AWPA Executive Committee pursuant to the AWPA Technical Committee Regulations.

### 1. GENERAL INFORMATION AND PURPOSE

### 2. TYPES OF PROPOSALS

### 3. HOW TO USE THESE GUIDELINES

### 4. REQUIREMENTS FOR ALL SUBMISSIONS

- 4.1 Information Required for all Type 1 Submissions
- 4.2 Information Required for all Type 2 Submissions
- 4.3 Information Required for all Type 3 Submissions
- 4.4 Use of Control Treatments
- 4.5 Wood Species
- 4.6 Test Retentions

### 5. METHODOLOGY FOR GENERATING PERFORMANCE DATA

- 5.1 Wood Preservative Efficacy
  - 5.1.1 Laboratory Efficacy
    - 5.1.1.1 Soil Block
    - 5.1.1.2 Soft Rot
    - 5.1.1.3 Termite
    - 5.1.1.4 Soil Bed
  - 5.1.2 Field Testing
    - 5.1.2.1 Field Stake
    - 5.1.2.2 Posts
    - 5.1.2.3 Above-Ground
    - 5.1.2.4 Termite
    - 5.1.2.5 Marine Panels
- 5.2 Wood Preservative Depletion
  - 5.2.1 Laboratory Depletion
    - 5.2.1.1 Water Leach
    - 5.2.1.2 Soil Leach
    - 5.2.1.3 Evaporative Aging
  - 5.2.2 Field Depletion
    - 5.2.2.1 Field Stakes
    - 5.2.2.2 Above-Ground
    - 5.2.2.3 Marine Panels
- 5.3 Affect on Wood Physical Properties
  - 5.3.1 Strength
    - 5.3.1.1 Strength of Solid-wood Products
    - 5.3.1.1 Strength of Composite Wood Products
  - 5.3.2 Electrical Conductivity
  - 5.3.3 Hygroscopicity
  - 5.3.4 Fire Properties
- 5.4 Corrosivity
  - 5.4.1 Treating Solution
  - 5.4.2 Treated Wood
- 5.5 Fixation Rate

### 1. GENERAL INFORMATION AND PURPOSE

New wood preservatives are listed in the AWPA Standards by means of a proposal and supporting data package submitted to the appropriate AWPA Subcommittee, followed by a discussion and voting process. The complete listing procedure is outlined in the AWPA Technical Committee Regulations. A similar procedure is followed to expand the applications for a listed preservative or modify the composition of a preservative system already listed in the AWPA Standards. The purpose of this Appendix is to guide proponents in the type of data necessary to be included in a supporting data package to propose listing a new preservative or modify the listing of an existing one. A proponent should be familiar with the AWPA Use Category System (UCS). Refer to the AWPA Book of Standards for information on the UCS. For more specific guidance on preservative standardization, proposal sponsors are encouraged to interact with the appropriate Technical Committees early in the preservative evaluation process. This can be initiated by asking Association Staff (see [www.awpa.com](http://www.awpa.com) for contact information) for the appropriate Subcommittee Chair to contact.

This document specifies certain data requirements for consideration of new wood preservatives or modifications to the listing of existing preservative systems. While the proponent of a preservative system is expected to provide all data required by this document, it is understood that it may not be possible to develop one or more types of data in some cases. In the event required data is not submitted, the proponent shall provide justification for not doing so. Notwithstanding the stated requirements of this document, the appropriate Subcommittee shall be the final arbiter of the type, quantity, and validity of the data needed for the listing of a preservative system.

The AWPA preservative Standards list both complete wood preservative systems (e.g. CCA Type C) and unformulated biocides (e.g. pentachlorophenol). These guidelines apply to both preservative types. A wood preservative system is a formulated product that is typically composed of biocide(s), formulation aids, performance additives such as moldicides, and a solvent/carrier. A biocide has to be formulated into a

solvent or carrier system prior to use (e.g. AWPA P9 Type A solvent for pentachlorophenol). Performance data on a biocide has to be generated using a formulated product. The solvent or carrier type can have a large affect on biocide performance. The wording of the Standard for a preservative biocide will limit the use of the preservative to the solvent (s) or carrier system(s) used in the data package to support the listing proposal.

After standardization of a new wood preservative, the proponents shall provide yearly data updates to the appropriate Subcommittee on critical field tests for a period of five years. Standards are then reaffirmed at 5 year intervals (see Appendix I of the AWPA Technical Committee Regulations).

## 2. TYPES OF PROPOSALS

These guidelines cover three types of wood preservative system proposals:

***Type 1 - Listing of a new preservative system or biocide in the AWPA Standards; or making a major modification to a previously standardized preservative.*** Examples of major modifications are addition or deletion of fungicides targeting decay fungi or insecticides targeting wood-destroying insects.

***Type 2 - Listing an AWPA standardized wood preservative system or biocide in a new use category or categories.***

***Type 3 - Minor composition modification(s) to an AWPA standardized wood preservative system.*** Examples of minor modifications are: a) Changes in ratios of biocides in multi-component systems; or b) Substantial modification of the carrier or solvent system.

The distinction between major and minor modifications (*Type 1* and *Type 3* proposals) may be unclear at times. A proponent is encouraged to interact with the appropriate AWPA Technical Subcommittee for guidance on how to classify a proposal (see Section 1, above).

Additives are not normally considered during the preservative review process. In commercial practice, additives are sometimes formulated with the treating solution and/or formulation to improve product acceptance (e.g. to enhance solvency or surface tension; inhibit treating plant corrosion; reduce mold growth; enhance the color, water repellency, or resistance of corrosion of fasteners in the treated product; or to generally improve the quality of the formulation). When an additive-containing formulation is supplied for use, it is the responsibility of the chemical supplier or formulator to fully

document the effect of the modified formulation on preservative efficacy, treated wood strength, corrosivity, etc.

## 3. HOW TO USE THESE GUIDELINES

To use these guidelines, the proponent should:

1. Determine what type of proposal is being considered (see Section 2 of this Appendix).
2. Decide in what Use Categories the treated wood product using the preservative will be used (see Section 2 of Standard U1, this describes the different Use Categories).
3. Determine what other information should be included in the proposal and data package by referring to Section 4 of this Appendix.
4. Depending on the proposal type and Use Categories of interest, determine the performance data requirements by referring to Table 1 of this Appendix. This Table is used in conjunction with Section 5, Methodology for Generating Performance Data, which describes the individual data requirements in more detail.

## 4. REQUIREMENTS FOR ALL SUBMISSIONS

**4.1 Information Required for All *Type 1* Submissions – All *Type 1* proposals shall include the following information:**

**4.1.1 Proposed wording for the preservative listing in the appropriate Standard.** The proponent should model the proposed wording on what is currently used in the relevant Standard.

**4.1.2 Listing of the proposed Use Categories and corresponding retentions for which the preservative is proposed to be used.**

**4.1.3 Active ingredient composition of the wood preservative system to be standardized.** All active ingredients and their percentage composition in the system shall be listed. Information on acceptable variation on these specifications shall be provided.

**4.1.4 Chemical composition of the carrier or solvent system(s).**

**4.1.5 Chemical and physical properties of the biocide, or wood preservative system and its active ingredients.** Pertinent information on the chemical and physical properties shall be provided. Particular emphasis should be placed on chemical and thermal stability since these factors may have an effect on the long term performance. For wood preservative systems, properties information shall be provided for the individual active ingredient(s), as well as the system itself.

Examples of relevant chemical and physical properties are: vapor pressure, boiling point, density, viscosity, solubility in common solvents including water, thermal stability, and hydrolytic stability.

**4.1.6 EPA registration status.** A proposal to list a preservative can be made while that preservative is still in the EPA registration process, but standardization cannot occur until registration is complete (see Section 7.5.7 of the AWPA Technical Committee Regulations).

#### **4.1.7 MSDS(s) of biocide or wood preservative system.**

##### **4.1.8 Methods for determination of:**

A. Active ingredient concentration(s) in the wood treating solution.

B. Retention or loading of active ingredient(s) in the treated wood.

C. Penetration of active ingredient(s) in treated wood.

**4.1.9 Treatability.** At a minimum, information on the penetration and resulting gradient resulting from laboratory treatment of southern pine sapwood with the proposed wood preservative system or formulated biocide shall be provided.

#### **4.1.10 Performance data as specified in Table 1 and Section 5.**

**4.2 Information Required for All Type 2 Submissions** – All Type 2 proposals shall include information on items 1, 2, and 10 as listed in Section 4.1, above.

**4.3 Information Required for All Type 3 Submissions** – All Type 3 proposals shall include information on items 3-7, 9, and 10 as listed in Section 4.1, above.

**4.4 Use of Control Treatments** – All evaluations of wood preservative performance shall include comparative information from untreated wood controls and at least one AWPA-listed preservative system with a commercial history of use in the same Use Category or Categories as the proposed system. Comparison to two listed wood preservatives is recommended.

**4.5 Wood Species** – If the preservative is intended for use with softwoods, southern pine sapwood is preferred for performance evaluations. If the preservative is to be used with hardwoods, representative species for the proposed commercial application(s) should be used for evaluating the performance of the preservative.

**4.6 Test Retentions** – Choosing preservative retention(s) to be evaluated in performance tests is a critical part of the experimental design. In all cases, it is important to include retentions at or close to the projected commercial use retentions of the preservative. For tests that evaluate the fungal and insect resistance of the preservative, it is highly desirable to include retentions that bracket the performance

threshold. See AWPA Standard E7, Section 6.4 for additional general guidance on retentions.

## **5. Methodology for Generating Performance Data**

This section describes the performance testing requirements listed in Table 1 in more detail and gives some example methods to obtain the performance data. Standard test methods are not available for evaluating all of the performance criteria. Whenever standard methods are not available, nonstandard methods are suggested. Use of methods other than those suggested (or modified suggested methods) may also be acceptable provided they are based on sound experimental principles. A decision on the acceptability of data generated by new or modified test methods will be made by the particular AWPA Subcommittee that has jurisdiction over listing the proposed preservative. The name of the institution or company which performed the test shall be stated. The use of third-party testing labs and agencies for critical tests is recommended.

The final decision on whether the data package supports the proposed wood preservative lies with the appropriate Subcommittee. Data substitutions may be allowed by the Subcommittee. For example, extensive and long term field stake data may mean that supporting laboratory soil block data is not necessary. Appropriate field stake data may also preclude the need for above-ground data for preservatives intended for UC3B applications. Allowing such data substitutions is the prerogative of the Subcommittee. Guidance on such issues can be obtained from the appropriate Subcommittee Chair. Contact information can be obtained from Association Staff (found at [www.awpa.com](http://www.awpa.com)).

### **5.1 Wood Preservative Efficacy**

This section refers to anti-fungal and anti-insect performance properties of the preservative.

#### **5.1.1 Laboratory Efficacy**

##### **5.1.1.1 Soil Block**

Preferred Method: AWPA E10, *Standard Method of Testing Wood Preservatives by Laboratory Soil-block Cultures*.

The soil block test is the most commonly used lab method for evaluating the performance of wood preservatives against basidiomycete wood decay fungi. The experiment should be designed to bracket the expected performance threshold of the preservative, and also include loadings at, or close to, the proposed use retentions.

Data from a minimum of three basidiomycete species is required. If the wood preservative is intended for use in

softwoods, three brown rot species shall be used. For preservatives to be used in hardwoods, three white rot species shall be used. If the preservative is intended to be used in both softwoods and hardwoods, data from three of each fungal type shall be provided. Consult E10 for guidance on selection of fungal species and strains.

#### 5.1.1.2 Soft Rot

Preferred Method: Modified AWPA E14, *Standard Method of Evaluating Wood Preservatives in a Soil Bed*.

E14 can be modified for soft rot testing through the use of smaller test specimen sizes (e.g. 3 mm x 14 mm x 150 mm) and maintaining the soil water holding capacity (WHC) at 150% ± 10 % minimum. Ratings should be performed visually or, if preferred, by use of a modified Modulus of Elasticity (MOE) test apparatus to measure static MOE as compared to a water soaked control (see Y.Q. Gui, D.D. Nicholas, and D. Crawford. 1996. A Miniature Mechanical Apparatus and Test Protocol for Bending and Crushing Test in Wood Preservation Research. Forest Prod. J. 46[10]:77-80).

#### 5.1.1.3 Termite

Preferred Method: AWPA E1, *Standard Method for Laboratory Evaluation to Determine Resistance to Subterranean Termites*.

Termites are very sensitive to volatiles in this type of small-container lab test. Care should be taken to include suitable solvent and carrier controls, and weather the blocks appropriately. The eastern subterranean termite (*Reticulitermes flavipes*) should be used as the test organism. If the preservative system will be used in regions where the Formosan subterranean termite (FST, *Coptotermes formosanus*) is present, testing this insect shall also be done. If such data is not provided, recommendation for use of the preservative in FST regions cannot be provided.

#### 5.1.1.4 Soil Bed

Preferred Method: AWPA E14, *Standard Method of Evaluating Wood Preservatives in a Soil Bed*.

The test method accommodates some exposure variability. Soil physical characteristics, average soil moisture content as expressed as a percentage of the water holding capacity, and bin maintenance procedures (soil replacement, etc.) shall be reported.

### 5.1.2 Field Testing

#### 5.1.2.1 Field Stake

Preferred Method: AWPA E7, *Standard Method of Evaluating Wood Preservatives by Field Tests with Stakes*.

Data from a minimum of two geographically separated test sites are required. These sites should be selected so that they provide two distinctly different climates and soil types. In known high decay hazard areas (e.g. Gulf Coast region and windward Hawaii) the minimum exposure time is three years, provided that field depletion data from the same site over the same time period is also included (Section 5.2.2.1). For areas of lower decay hazard (e.g. Wisconsin), or if depletion data over the same exposure period is not available, longer exposure times are required. In these cases, the Subcommittee evaluating the proposal will determine whether the length of exposure time is adequate.

#### 5.1.2.2 Posts

Preferred Method: AWPA E8, *Standard Method for Field Tests with Posts*.

Treated post evaluation is recommended when the preservative system is to be used in roundwood commodities.

#### 5.1.2.3 Above-Ground

Preferred Methods: AWPA Standards E9, *Standard Field Test for the Evaluation of Wood Preservatives to be used in Non-Soil Contact*; E16, *Standard Field Test for Evaluation of Wood Preservatives to be used Out of Ground Contact: Horizontal Lap-Joint Method*; or E18, *Standard Field Test for Evaluation of Wood Preservatives Intended for Use Category 3B Applications, Exposed, Out of Ground Contact, Uncoated Ground Proximity Decay Method*.

E9 was designed for evaluating millwork preservatives. E16 and the Ground Proximity method are more general tests. In known high above-ground decay rate climates (e.g. windward Hawaii) the minimum exposure time is three years, provided that field depletion data from the same site over the same time period is also included (Section 5.2.2.2). For areas of lower above-ground decay hazard (e.g. Gulf Coast states), or if depletion data over the same exposure period is not available, longer exposure times are required. In these cases, the Subcommittee evaluating the proposal will determine whether the length of exposure time is adequate.

#### 5.1.2.4 Termite

Preferred Method: Forintek method published in IRG/W30309 (2003) or as attached to the Fall 2003 AWPA Subcommittee P-6 Report

A minimum of two years exposure is required. Substantial attack of untreated controls should be observed at the end of the test exposure time. At a minimum, testing should be done with the Eastern subterranean termite (*Reticulitermes flavipes*). If the preservative system will be used in regions where the Formosan subterranean termite (FST, *Coptotermes*

*formosanus*) is present, testing with this insect shall be done as well. If such data is not provided, recommendation for use of the preservative in FST regions cannot be provided.

E7 field stake data from a field site with apparent high termite activity may be used to substitute for data from a termite-specific test method as described above.

#### 5.1.2.5 Marine Panels

Preferred Method: AWP A E5, *Standard Test Method for Accelerated Evaluation of Wood Preservatives for Marine Services by Means of Small Size Specimens* (Type A or B panels)

Test sites shall be chosen based on the proposed marine Use Category application(s). See Standard U1, Section 2, for the geographical and hazard organism specifications for the 5A, 5B, and 5C Use Categories. Also see Commodity Specification G of Standard U1 for further information. Data from a minimum of two geographically separated test sites are required. The minimum exposure time is two years provided that marine depletion data from the same sites over the same time period are also included (Section 5.2.2.3). If depletion data over the same exposure period is not available, longer exposure times are required. In these cases, the Subcommittee evaluating the proposal will determine whether the length of exposure time is adequate.

## 5.2 Wood Preservative Depletion

### 5.2.1 Laboratory Depletion

#### 5.2.1.1 Water Leach

Preferred Method: AWP A E11, *Standard Method of Determining the Leachability of Wood Preservatives*.

For preservatives proposed for UC5A-C, leaching should be done using natural or artificial seawater.

#### 5.2.1.2 Soil Leach

Preferred Method: AWP A E20, *Standard Method for Determining the Leachability of Wood Preservatives in Ground Contact*.

#### 5.2.1.3 Evaporative Aging

Preferred Method: EN 73, *Accelerated aging of treated wood prior to biological testing. Part I: Evaporative aging procedure*.

Evaporative aging is applicable to wood preservative systems where one or more of the active ingredients are organic compounds with a significant vapor pressure. Loss of this type of active should be monitored in the test. It may not be

necessary to generate evaporative aging data on actives with little or no volatility at typical exposure conditions.

### 5.2.2 Field Depletion

#### 5.2.2.1 Field Stakes

Preferred Method: Based on AWP A E7, Section 10

A minimum of three years exposure is required from two test sites for the initial proposal data package. A minimum of five replicate depletion stakes should be removed and analyzed after one and three year exposures. Three cross sectional zones (outer, middle, and core) should be cut from a subsample cut from immediately below the stake groundline. In addition and at a minimum, sufficient stakes should be installed initially to allow removal and analysis of stakes after an additional 5 years of exposure (8 years total). Eight year results shall be reported to the appropriate Subcommittee at the five year review after standardization.

#### 5.2.2.2 Above-Ground

Preferred Method: Above-ground depletion evaluation should be done using test specimens and exposure identical or similar to test specimens exposed for decay resistance - AWP A Standards E9, E16, or E18.

There are no standardized above-ground field depletion methods. In general, the above-ground field depletion method used should be similar to the method used to evaluate the field biological resistance. In all cases a matched unexposed set of specimens shall be analyzed using the same subsampling and analytical methods as the exposed specimens.

Depletion specimens should be installed at the same time that above-ground decay evaluation specimens are installed. A minimum of three years total exposure is required from two test sites for the initial proposal data package. A minimum of five replicate depletion specimens should be removed and analyzed after one and three year exposures. The exact geometry of the analytical specimens will depend on the specifications of the exposure specimen. In addition and at a minimum, sufficient depletion specimens should be installed initially to allow removal and analysis of stakes after an additional 2 years of exposure (5 years total).

#### 5.2.2.3 Marine Panels

Preferred Method: Marine depletion evaluation should be done using test specimens and exposure identical or similar to test specimens exposed for durability testing. (AWP A E5 Type A or B panels.)

Depletion specimens should be installed at the same time that marine evaluation specimens are installed. A minimum of two years total exposure is required from two test sites for the initial proposal data package. A minimum of five replicate

depletion specimens should be removed and analyzed after one and two year exposures. The analytical subspecimens should be cut from the center region of the exposure panel. In addition and at a minimum, sufficient depletion specimens should be installed initially to allow removal and analysis of stakes after an additional 3 years of exposure (5 years total).

### 5.3 Affect on Wood Physical Properties

Preferred Methods: The preferred method depends on the type of material being considered. For treated solid wood use general methods of ASTM D 5664-02; for treated composite products use methods of ASTM D 5516-01.

#### 5.3.1 Strength

##### 5.3.1.1 Strength of Solid-wood Products

For treated solid wood products that are NOT intended for any in-service exposure to elevated temperatures (>50C), the preferred method is to follow ASTM D 5664-02 Procedure #1 using small-clear specimens cut from end-matched treated and untreated 2x4's (see section 4.2 of ASTM D5664-02). For treated solid wood products that are intended for an in-service exposure at elevated temperatures (>50C), the preferred method is to follow both ASTM D 5664-02 Procedure #1 and #2 (see section 4.2 and 4.3 of that Standard). Alternatively, ASTM D 5664-02 Procedure #3 which evaluates full-size lumber may be instead substituted for this latter testing requirement.

##### 5.3.1.2 Strength of Composite Wood Products

For composite wood products that are NOT intended for any in-service exposure to elevated temperatures (>50C), the preferred method is to follow ASTM D 5516-03 using composite specimens from matched treated and untreated panels of the appropriate composite as detailed in the D 5516-03 Standard except skipping the requirements of sections 7.1 and 7.2 of D 5516-03 for high-temperature exposure and subsequent testing of that material. For treated composite wood products that are intended for an in-service exposure to elevated temperatures (>50C), the preferred method is to follow all recommendations of ASTM D 5516-03 procedures.

#### 5.3.2 Electrical Conductivity

Preferred Method: See Katz and Miller. 1963. Proc. AWPA, 59, pp. 204-217.

The preferred method is a method for determination of electrical resistance. Other methods that specifically measure conductivity may be used.

#### 5.3.3 Hygroscopicity

Preferred Method: ASTM D3201 (*Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Based Products*) using  $92 \pm 2\%$  RH with a test length of 14 days.

#### 5.3.4. Fire Properties

Preferred Method: ASTM E1354-97 (*Standard Test Method for Heat and Visible Smoke Release Rates for Products Using an Oxygen Consumption Calorimeter*) using a sample dimension of 100 x 100 mm, and a heat flux rate of 50 kW/m<sup>2</sup>. If smoke toxicity is a potential concern for the wood preservative system under consideration, ASTM E662 (Smoke Generated by Solid Materials) should be performed in conjunction with BSS 7239 (Smoke Toxicity), measuring the specific gases CO, HF, NO<sub>2</sub>, HCl, HCN, and SO<sub>2</sub>.

#### 5.4 Corrosivity

##### 5.4.1 Treating Solution

Preferred Method: AWPA E17, *Standard Method for Determining Corrosion Rates of Metals in Contact with Treating Solutions*.

##### 5.4.2 Treated Wood

Preferred Method: AWPA E12, *Standard Method of Determining Corrosion of Metal in Contact with Treated Wood*.

AWPA E12 is a lab test. Field testing of commercial fasteners in the treated wood is also useful. Consult with AWPA Subcommittee P-6 for typical non-standardized fastener/wood field test methods.

#### 5.5 Fixation Rate

Preferred Method: AWPA E19, *Standard method for Determining Preservative Fixation of Waterborne Wood Preservatives*.

This method determines the time required for the fixation reactions of a reactive waterborne inorganic wood treatment system to be complete at a given temperature. The fixation rate requirement is only applicable to this type of preservative system. Fixation rate data for organic and non-fixing inorganic systems is not required.

**Table 1.** Summary of data required in a data package used to support a proposal to list a new wood preservative system in the AWPA Standards, make major or minor modifications to an AWPA-listed preservative, or expand the applications for a listed wood preservative into new use categories. See Section 5.0 of these Guidelines for further information on test methods.

(M = Mandatory, R = Recommended)

TESTING REQUIREMENTS	Section	UC1	UC2	UC3A	UC3B	UC4A-C	UC5A-C
<b>Wood Preservative Efficacy</b>							
<b>Laboratory Efficacy Testing</b>							
Soil Block	5.1.1.1		M	M	M	M	M
Soft-Rot	5.1.1.2					M	M
Termite	5.1.1.3	M	M	M	M	M	M
Soil Bed	5.1.1.4			R	R	R	R
<b>Field Efficacy Testing</b>							
Field Stakes	5.1.2.1			R	R	M	M
Post	5.1.2.2					R	R
Above-Ground	5.1.2.3		M	M	M		
Termite	5.1.2.4	M	M	M	M	M	M
Marine Panels	5.1.2.5						M
<b>Wood Preservative Depletion</b>							
<b>Laboratory Depletion Testing</b>							
Water Leach	5.2.1.1		R	M	M	M	M
Soil Leach	5.2.1.2					M	M
Evaporative Aging <sup>a</sup>	5.2.1.3	M	M	M	M	M	M
<b>Field Depletion Testing</b>							
Field Stake	5.2.2.1					M	M
Above-Ground	5.2.2.2		R	M	M		
Marine Panels	5.2.2.3						M
<b>Physical Properties of Treated Wood</b>							
Strength	5.3.1	M	M	M	M	M	M
Electrical Conductivity <sup>b</sup>	5.3.2				M	M	M
Hygroscopicity	5.3.3	M	M	M	M	M	M
Fire Properties	5.3.4	M	M	M	M	M	M
<b>Preservative Corrosivity</b>							
Preservative Solution	5.4.1	M	M	M	M	M	M
Treated Wood	5.4.2	M	M	M	M	M	M
<b>Preservative Fixation Rate <sup>c</sup></b>	5.5	M	M	M	M	M	M

<sup>a</sup> Evaporative aging is applicable to wood preservative systems where one or more of the active ingredients are organic compounds with a significant vapor pressure.

<sup>b</sup> This mandatory requirement applies only to components of utility line structures and railway ties. Other UC3B and UC4A-C applications have no data requirements for electrical conductivity testing.

<sup>c</sup> Fixation rate determination is applicable only to a reactive waterborne inorganic wood treatment system.