GDA-17

AMERICAN WOOD PROTECTION ASSOCIATION

GUIDANCE DOCUMENT A: DATA REQUIREMENT GUIDELINES FOR LISTING WOOD PRESERVATIVES IN THE AWPA STANDARDS

Jurisdiction: Technical Committee P-1

Adoption: Previously Appendix A to the AWPA Technical Committee Regulations, this document was converted to a Guidance Document by the AWPA Executive Committee in January 2013.

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This Guidance Document is not an AWPA Standard. These are nonmandatory guidelines presented to aid the user in understanding 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 Guidance Document does not constitute conformance to any AWPA Standard. No product can be considered to conform to 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

New wood preservatives are listed in the AWPA Standards by means of a proposal and supporting data package submitted to the appropriate AWPA Technical Committee, 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 Guidance Document 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 for contact information) for the appropriate Technical Committee 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 Technical Committee 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 HSA for pentachlorophenol). Performance data on a biocide has to be generated using a formulated product. The solvent or carrier type can have a large effect 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 Technical Committee on critical field tests until at least 10 years data have been provided. Standards are then reaffirmed at 5 year intervals (see AWPA Guidance Document I).

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. (Sections 4 and 5)

Type 2 **Listing an AWPA standardized wood preservative system or biocide in a new use category or categories.** (Section 6)

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. (Section 7)

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 Committee 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 Guidance Document).

2. Decide in what Use Categories the treated wood product using the preservative will be used (see Section 2 of Standard U1, which 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 Guidance Document.

4. Depending on the proposal type and Use Categories of interest, determine the performance data requirements by referring to Table 1 of this Guidance Document. 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 TYPE 1 SUBMISSIONS

4.1 Wording of Standard. The 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.

4.2 Use Categories and corresponding retentions. The proponent must list the proposed Use Categories for which the preservative is proposed to be used along with their respective proposed retentions

4.3 Active ingredient composition. All active ingredients and their percentage composition in the proposed system shall be listed. Information on acceptable variation on these specifications shall be provided.

4.4 Carrier or solvent system composition. Chemical composition of the carrier or solvent system(s) must be defined.

4.5 Properties of the preservative system and its active ingredients.

Pertinent information on the chemical and physical properties of all biocides and active ingredients of the preservative system 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.

4.6 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 12.2 of the AWPA Technical Committee Regulations).

4.7 MSDS(s) of biocide or wood preservative system.

4.8 Methods for analysis Methods for determining the following shall be provided:

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.

4.9 Treatability. At a minimum, data from three (3) pilot plant charges with a minimum of 20 pieces each of 2x4 or larger Southern pine or other species of interest should be provided. If the preservative is intended for a narrow range of species excluding treatable softwoods, data on one of the species of interest should be provided instead. When less than six (6) feet in length, the lumber shall be end-sealed. Information on the penetration and resulting gradient shall be provided. Additional information required by the Treatments Committees is found in AWPA Guidance Document E.

4.10 Performance data. Specific performance data is required as specified in Table 1 and Section 5.

5. PERFORMANCE DATA REQUIREMENTS AND METHODOLOGY

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 Technical Committee 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. Guidance on such issues can be obtained from AWPA or the Chair of the P General Committee.

5.1 General Considerations

5.1.1 Use of Reference Treatments. The reference treatment(s) for all performance tests shall be a currently listed AWPA preservative (in the same Use Category as the proposed system) that has completed at least one five-year reaffirmation cycle or has presented a minimum of 10 years of field test data to the association. Reference treatment retentions used for preservative efficacy testing must be at levels suitable for producing a reasonable degradation curve that allows for comparison of performance with the candidate system. Reference retentions for other tests must be at the specified retentions for the end-use the new system is being proposed for and compared to.

5.1.2 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.

5.1.3 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. Retentions for testing other parameters such as physical properties and depletion should be at the levels proposed for the most severe Use Category.

5.1.4 Formulation Changes. While it is likely that small changes in formulation may occur during development of a protective system, the primary data considered shall be based upon the proposed formulation. Where supporting data are presented on earlier formulations which differ from the formulation proposed for standardization in a manner reasonably anticipated to impact performance, suitable bridging data to the proposed formulation should be supplied.

5.2 Preservative Efficacy

This section refers to anti-fungal and anti-insect performance properties of the preservative. Proposed retention recommendations shall be such that the proposed system will provide comparable performance to established reference preservative system(s).

5.2.1 Laboratory Efficacy

5.2.1.1 Basidiomycete Decay

Preferred Method: AWPA E10, *Standard Method of Testing Wood Preservatives by Laboratory Soil-block Cultures*. Alternative Method: AWPA E22, *Standard Accelerated Laboratory Method for Testing the Efficacy of Preservatives against Wood Decay Fungi Using Compression Strength.*

It is recommended that data from the E10 soil block test be provided. 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.

5.2.1.2 Soft Rot

Preferred Method: AWPA E23, *Accelerated Method of Evaluating Wood Preservatives in Soil Contact.* Alternative Method: Modified AWPA E14, *Standard Method of Evaluating Wood Preservatives in a Soil Bed*.

E14 can be optimized for soft rot testing as prescribed in Section 2.4 of E14. Note: Lower soil moisture content in E23 will favor basidiomycete attack over soft rot.

5.2.1.3 Termite

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

Data using both the choice method and no-choice method (Sections 2.1 and 2.2) shall be presented.

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 Formosan subterranean termite (FST, *Coptotermes*

formosanus) should be used as the test organism. If such data is not provided by laboratory and field data, recommendation for use of the preservative in FST regions cannot be provided. If the preservative is not to be used in areas with Formosan subterranean termites, then Eastern subterranean termite (*Reticulitermes flavipes*) testing shall be done.

5.2.2 Simulated Field Testing

5.2.2.1 Ground Contact

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

A soil bed test is intended to be a simulation of field testing. The test method accommodates some exposure variability. AWPA E14 can be optimized for basidiomycete attack by using a reduced soil moisture content. 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.

5.2.3 Field Testing

Refer to section 5.1.1 for guidance on reference preservative treatments.

5.2.3.1 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 aggressive ground contact decay hazard test sites are required (three sites are recommended). At least one of these sites shall have an actively foraging population of termites. For tests involving copper based wood preservatives, it is recommended that one of the test sites have documented presence of copper tolerant fungi. These sites should be selected so that they provide at least two distinctly different climates and soil types. One or more test sites must be located within continental North America. In documented aggressive ground contact decay hazard sites 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 Technical Committee evaluating the proposal will determine whether the length of exposure time is adequate.

5.2.3.2 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.

5.2.3.3 Above-Ground

Preferred Methods: AWPA E9, *Standard Field Test for the Evaluation of Wood Preservatives to be used in Non-Soil Contact*); AWPA E16, *Standard Field Test for Evaluation of Wood Preservatives to be used Out of Ground Contact: Horizontal Lap-Joint Method*; or AWPA 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*. Alternative Methods: AWPA E25, *Standard Field Test for Evaluation of Wood Preservatives to be Used Above Ground (UC3B): Decking Method*; and AWPA E27, *Standard Field Test for Evaluation of Wood Preservatives to be Used out of Ground Contact: Three Component Horizontal Lap-Joint Method.*

E9 was designed for evaluating millwork preservatives (UC3A). E16 and E18 are more general tests (UC3B). If a preservative is developed for above ground use only and meaningful and acceptable ground contact data are not submitted, a minimum of five years above-ground test data shall be provided. In known high above-ground decay rate climates, (e.g. windward Hawaii) the minimum exposure time is three years for E18, or five years for other above-ground field test methods. 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 Technical Committee evaluating the proposal will determine whether the length of exposure time is adequate.

5.2.3.4 Termite

Preferred Method: AWPA E26, *Standard Field Test for Evaluation of Wood Preservatives Intended for Interior Applications (UC1 and UC2): Termite Ground Proximity Method.* Alternative Method: AWPA E21, *Standard Test Method for the Evaluation of Preservative Treatments for Lumber and Timbers Against Subterranean Termites in Above-Ground, Protected Applications (UC1 and UC2).*

A minimum of two years exposure and until the average rating of untreated controls is less than 4. Less than two years data is acceptable provided there have been two rounds of failure of untreated controls. At a minimum, testing should be done with one subterranean termite species. 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. 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.

5.2.3.5 Marine Panels

Preferred Method: AWPA 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 Technical Committee evaluating the proposal will determine whether the length of exposure time is adequate.

5.3 Preservative Depletion

5.3.1 Laboratory Depletion

5.3.1.1 Water Leach

Preferred Method: AWPA 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.

5.3.1.2 Soil Leach

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

5.3.1.3Evaporative Aging

Preferred Method: EN73, *Accelerated aging of treated wood prior to biological testing. Part I: Evaporative aging procedure*.

Evaporative aging is only 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.

5.3.2 Field Depletion

5.3.2.1 Field Stakes

Preferred Method: Based on AWPA 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 at the targeted ground contact retention (UC4A) should be removed and analyzed after one and three year exposures. A cross section should be cut from a subsample cut from a zone from groundline to 50 mm below the 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 Technical Committee at the five year review after standardization.

5.3.2.2 Above-Ground

Preferred Method: Based on AWPA E9, E16, E18, or E27 Above-ground depletion evaluation should be done using test specimens and exposure identical or similar to test specimens exposed for decay resistance.

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 sub-sampling 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).

5.3.2.3 Marine Panels

Preferred Method: Based on AWPA E5 Marine depletion evaluation should be done using test specimens and exposure identical or similar to test specimens exposed for durability testing. (AWPA 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 sub-specimens 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).

5.4 Wood Physical Properties Effects

Physical properties need to be appropriate for the intended application. The limited scope of physical property testing in this section is intended to determine if wood treated with the candidate wood preservative system has strength properties that are similar to untreated wood and to other commonly used treated wood. If strength properties differ substantially, the product may still be suitable for many applications; however, specific recommendations for use may need to be made by the manufacturer of the treated wood which may require additional testing beyond the scope of this section.

5.4.1 Strength

5.4.1.1 Strength of Solid-wood and Other Dimensional Wood Products

Preferred Method: ASTM D5664**,** *Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant Treated Lumber, Procedure 1. Static Bending.*

Accepted test specimen sizes include; 38 x 38 x 584 mm, 50 x 50 x 760 mm and 25 x 25 x 410 mm. Loading span and supports shall be in accordance with ASTM D143, Section 8.2 or with Table 1 of ASTM D5664-08 for the 38 x 38 x 584 mm sample size.

Static bending samples may be generated in accordance with one of two methods. The First method is ASTM D5664-08, Procedure 1. This procedure uses small clear specimens cut from end-matched nominal 2x4 dimensional lumber to compare the initial effects of preservative treatments to untreated controls. It is not always practical to treat 4-foot long lumber and machine subsequent test samples from this material. The second method follows ASTM D5664 except in the preparation of test specimens by machining end- or side-matched specimens from lumber prior to treatment.

When using either method, the replicate sets used should be cut from at least 25 different parent boards. Care should be taken to ensure that the crown of the annual growth rings is centered as nearly practical across the tangential direction of the test pieces as flat or vertically sawn as practical. All test specimens prepared using either of these methods are then mechanically tested following the various test methods detailed in ASTM D5664.

When preparing all test specimens for mechanical tests in accordance with ASTM D5664 one should consider that in Section 5.1.1 of this Guidance Document it is noted that all evaluations of wood preservative performance shall include comparative information from untreated wood controls and at least one AWPA-listed preservative system. This requires that at least 3 end-matched test specimens, or side-matched if appropriate, be prepared for each replicate in a set.

For treated solid wood products that are intended for an in- service exposure at elevated temperatures (>50°C), the preferred method is ASTM D5664-08, Procedure 2. Again, sample preparation may be performed in accordance with ASTM D5664 as outlined above. ASTM D5664 Procedure 3, which evaluates full-size lumber may be used to supplement data obtained from Procedures 1 and 2. For solid wood and other dimensional wood products not intended for in-service exposure at elevated temperatures (>50°C), high-temperature exposure and testing are not required.

5.4.1.2 Strength of Composite Wood Panel Products

Preferred Method: ASTM D 5516, *Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to Elevated Temperatures.*

Static bending samples should be generated in accordance with ASTM D5516, Section 7.3 and tested for flexural stiffness and strength in accordance with ASTM D3043, Test Method A. This procedure specifies a sample size to be treated of 610 mm by 1220 mm (2 by 4 ft). While this is the preferred method it is not always practical to treat 4-foot wide panels and machine subsequent test samples from this material. Alternatively, the 610 mm by 1220 mm (2 by 4 ft) specimens can be machined in accordance with Test Method D5516, Section 6.4.1 prior to treatment.

In general, when preparing samples for static bending tests one should consider that in Section 5.1.1 of this Guidance Document it is noted that all evaluations of wood preservative performance shall include comparative information from untreated wood controls and at least one AWPA-listed preservative system. This requires that sufficient test specimens be prepared for each replicate set. Replicate sets should be sufficient as to allow statistical comparison of the data.

For treated wood panel products that are intended for an in-service exposure at elevated temperatures (>50°C), the preferred method is ASTM D5516, Procedures 7.1 and 7.2 for high temperature exposure and subsequent testing of that material according to Section 7.3. For composite wood panel products not intended for in-service exposure at elevated temperatures (>50°C), high-temperature exposure and testing are not required.

5.4.2 Electrical Conductivity

Conductivity of treated wood is primarily of concern for utility crossarm and poles, or for railroad crosstie applications. For these products, the purchaser should be consulted for any specific requirements. The ARMEA Manual for Railway Engineering Section 2.8 describes an electrical impedance test for crossties. Katz and Miller (AWPA Proceedings, Vol. 59, pp. 204-217, 1963) described a method for comparing treated wood conductivity to that of untreated controls. Other methods may be used. When products demonstrate conductivity substantially different than untreated wood or other products currently used for an application, the proponent should complete adequate additional testing to ensure suitability for the proposed end use.

5.4.3 Hygroscopicity

Preferred Method: ASTM D3201, *Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Based Products*

Hygroscopicity of southern pine sapwood shall be determined in accordance with ASTM D3201. Other standards with conditioning at the same conditions may be used, however, samples must be demonstrated to have reached equilibrium moisture content. The test shall be considered valid if untreated controls are within or very close to the expected range of 20 to 23 % moisture content.

5.4.4 Corrosion in Treated Wood

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

This is a lab test that provides the relative corrosion rates of metal coupons in contact with treated wood compared to other standardized preservatives. It does not provide information regarding the corrosion rate of metal in contact with treated wood in actual applications. Field testing of fasteners in treated wood is generally done by the fastener manufacturers. If corrosion is excessive compared to CCA or other commonly used preservatives, the proponent shall make specific recommendations for corrosion resistant metals appropriate for contact with the treated wood (including those for fasteners or connectors).

5.4.5 Secondary Bonding

Preferred Methods: ASTM D2559, *Standard Specification for Adhesives for Structural Laminated Wood Products for Use Under Exterior (Wet Use) Exposure Conditions*; ASTM D7247, *Standard Test Method for Evaluating the Shear Strength of Adhesive Bonds in Laminated Wood Products at Elevated Temperatures*; ASTM D1101, *Standard Test Methods for Integrity of Adhesive Joints in Structural Laminated Wood Products for Exterior Use*. Alternative Method: Winandy, J.E. and Riven, B.H. 1986. Evaluation of a Method for Testing Adhesive-Preservative Compatibility. For Prod J 36(1):27-32.

For treated wood products that may be used in secondary manufacturing processes, for example glue laminated members, the effect of the preservative on the performance of the adhesive used may be important. The intent of the testing is this section is to provide evidence that bonding of the treated wood is feasible using at least one conventional adhesive and conventional bonding procedure. AWPA standards do not evaluate adhesive bonding, and this limited testing does not imply compliance with standards of other organizations such as ANSI and AITC.

5.5 Preservative Corrosivity

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

This test is to determine suitability of materials of construction at the treating plant. If excessive corrosion compared to CCA or other commonly used preservatives is found, the proponent shall provide recommendations for use of appropriate metals or other methods of protection for the treating plant tanks, cylinders and piping.

5.6 Preservative 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.

6 INFORMATION FOR ALL *TYPE 2* SUBMISSIONS. All *Type 2* proposals shall include information as listed in Sections 4.1, 4.2, and all of Section 5, above.

7 INFORMATION FOR ALL *TYPE 3* SUBMISSIONS. All *Type 3* proposals shall include information as listed in Sections 4.1, 4.3 through 4.7, 4.9, 4.10, and all of Section 5, above.

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.

DATA REQUIREMENTS	SECTION	UC1	UC2	UC3A	UC3B	UC4A-C	UC5A-C
Preservative Efficacy							
Laboratory Efficacy Testing							
Basidiomycete Decay Test	5.2.1.1		M	M	M	M	M
Soft-Rot	5.2.1.2					M	M
Termite	5.2.1.3	M	M	M	M	M	M
Simulated Field Testing							
Ground Contact	5.2.2.1			R	R	R	R
Field Efficacy Testing							
Field Stakes	5.2.3.1			R	R	M	M
Post	5.2.3.2					R	R
Above-Ground	5.2.3.3			M	M		
Termite	5.2.3.4	M	M	M	M	M	M
Marine Panels	5.2.3.5						M
Preservative Depletion							
Laboratory Depletion Testing							
Water Leach	5.3.1.1		R	M	M	M	M
Soil Leach	5.3.1.2					R	M
Evaporative Aging [a]	5.3.1.3	M	M	M	M	M	M
Field Depletion Testing							
Field Stake	5.3.2.1					M	M
Above-Ground	5.3.2.2			M	M		
Marine Panels	5.3.2.3						M
Physical Properties of Treated Wood							
Strength	5.4.1	M	M	M	M	M	M
Electrical Conductivity	5.4.2				M [b]	M [b]	
Hygroscopicity	5.4.3	M	M	M	M	M	M
Corrosion	5.4.4	M	M	M	M	M	M
Secondary Bonding [c]	5.4.5	R	R	R	R	R	R
Preservative Corrosivity	5.5	M	M	M	M	M	M
Preservative Fixation Rate [d]	5.6	R	R	R	R	R	R

M = Mandatory, R = Recommended. "Mandatory" means these data are a critical part of the data package. A data package that lacks mandatory data is very likely to be rejected by the committee unless strong justification is provided or an alternative test is performed. "Recommended test" means the test is an important part of the data package. A data package that lacks one or more recommended tests may be rejected by the committee unless strong justification is provided.

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

[b] 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.

[c] This requirement is mandatory for treated wood products that may be used in secondary manufacturing processes, such as lumber used to manufacture glue laminated members.

[d] Fixation rate determination is applicable only to a reactive waterborne inorganic wood treatment system.