



Standard Test Method for Wood Preservatives by Laboratory Soil-Block Cultures¹

This standard is issued under the fixed designation D1413; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

^{ε1} NOTE—Editorial corrections were made throughout in April 2008.

1. Scope

1.1 This test method covers determination of the minimum amount of preservative that prevents decay of selected species of wood by selected fungi under optimum laboratory conditions.

1.2 The requirements for preparation of the material for testing and the test procedure appear in the following order:

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1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

[D841 Specification for Nitration Grade Toluene](#)

¹ This test method is under the jurisdiction of ASTM Committee D07 on Wood and is the direct responsibility of Subcommittee D07.06 on Treatments for Wood Products.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[D1193 Specification for Reagent Water](#)

[D1758 Test Method for Evaluating Wood Preservatives by Field Tests with Stakes](#) (Withdrawn 2015)³

[D3345 Test Method for Laboratory Evaluation of Wood and Other Cellulosic Materials for Resistance to Termites](#)

[D3507 Test Methods for Penetration of Preservatives in Wood and for Differentiating Between Heartwood and Sapwood](#) (Withdrawn 2008)³

[E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves](#)

2.2 *Other Standards:*⁴

[AWPA E10 Testing Wood Preservatives by Laboratory Soil-Block Cultures](#)

3. Summary of Test Method

3.1 Conditioned blocks of wood are impregnated with different concentration solutions of a preservative in water or suitable organic solvent to produce a series of retentions of the preservatives in the blocks. After periods of conditioning or weathering, the impregnated blocks are exposed to one or more strains of wood-destroying fungi, one fungus for each test series. The minimum amount of preservative that in the prescribed testing protects the impregnated blocks against decay by a given test fungus is defined as the threshold retention for that organism. Failure to protect is evidenced by loss of wood from the treated wood blocks, as indicated by a loss in weight.

3.2 Provision must be made for coordinated preparation of the test cultures and for impregnation, conditioning, or weathering and conditioning, of the test blocks.

4. Significance and Use

4.1 This test method is useful in the development of new wood preservatives and preservative systems by evaluating the minimum preservative retention to prevent decay under laboratory conditions. The results are used to facilitate target retentions in subsequent tests for effectiveness against termites

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American Wood Protection Association (AWPA), P.O. Box 361784, Birmingham, AL 35236-1784, <http://www.awpa.com>.

(see Test Method D3345) and in field stakes (see Test Method D1758). The sections on Treatment and Preservative Permanence are referenced by other ASTM standards. The test method assumes that the test blocks exposed to certain conditions after treatment will achieve equilibrium, and will return to the same equilibrium after exposure to fungi. This assumption may lead to weight loss that is not due to decay. The test uses live cultures of fungal organisms that require careful colonization, storage, and feeding to remain viable strains.

5. Apparatus

5.1 *Conditioning Chamber or Room*, maintained at a selected temperature between 20 and 30°C (68 and 86°F) and a selected relative humidity between 25 and 75 %. The selected temperature shall not vary more than $\pm 1^\circ\text{C}$ ($\pm 2^\circ\text{F}$) and the selected humidity not more than $\pm 2\%$.⁵

5.2 *Incubation Room or Incubation Cabinet*, maintained at a selected temperature between 25 and 27°C (77 and 81°F) and a relative humidity between 65 and 75 %. The selected temperature shall not vary more than $\pm 1^\circ\text{C}$ ($\pm 2^\circ\text{F}$) and the selected humidity percentage not more than 2.

5.3 *Drying Oven*—A suitable, vented oven, maintained at a temperature of $105 \pm 2^\circ\text{C}$ ($220 \pm 4^\circ\text{F}$).

5.4 *Steam Sterilizer*.

5.5 *Balances*, fast-acting types preferred, sensitive and accurate to 0.01 g.

5.6 *Vacuum Pump or Water Suction Pump*, capable of reducing pressure to 100 mm (3.94 in.) mercury (Hg), or less.

5.7 *Impregnation Apparatus*—A suitable desiccator or bell jar shielded to protect personnel in event of breakage, provided with suitable separatory funnel or auxiliary flask for holding the treating solution and vacuum gage or manometer (Fig. 1).

5.8 *Trays or Racks, or Pin Bars*—Trays or racks made from suitable screening to permit free air movement around each block during initial drying and for convenient handling of the test blocks. Pin bars facilitate handling (see 7.2).

5.9 *Weathering Apparatus*:

5.9.1 *Forced Draft Oven*.

5.9.2 600 cm³ breakers for weathering of oil-type preservatives.

5.9.3 225 cm³ wide-mouth screw cap bottles for weathering water-borne preservatives.

5.10 *Culture Bottles*, cylindrical or square (Note 1), capacity nominal 225 or 450 cm³ (8 or 16 oz), fitted with screw caps without liners (Fig. 2). An alternate lid fitted (Note 2) with a 25-mm autoclavable filter with a pore size of 0.2 microns is permitted to reduce or prevent mite infestation during the test.

NOTE 1—*Culture Bottles*:

(1) 225-cm³ (8-oz) French square, for use with one block only.

(2) 225-cm³ (8-oz) cylindrical, for use with one or two blocks.

(3) 450-cm³ (16-oz) cylindrical, for use with two blocks only.

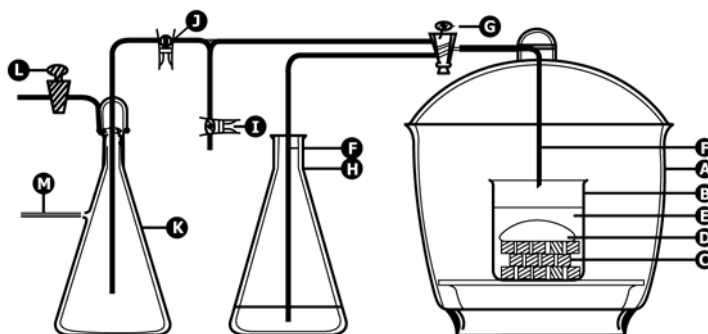
NOTE 2—Prepare the lids by drilling a 6.4-mm hole in the center and lightly sanding the underside with medium grit paper. Adhere the filter with a small amount of high temperature silicon or slow-curing epoxy and cure overnight. Ensure that the adhesive does not cover the drilled hole.

5.11 *Soil Sieves*—U.S. No. 6 sieve in accordance with Specification E11.

6. Reagents

6.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that

⁵ Scheffer, T. C., "Humidity Controls for Conditioning Rooms," Forest Products Laboratory Report No. 2048, U.S. Forest Service, 4 pp., 5 Figs., January 1956.



A—Vacuum desiccator, internal diameter 250 mm.
B—Plastic or glass treatment beaker.
C—Test wood blocks.
D—Glass or other suitable weight.
E—Treating solution.
F—Polyethylene tubing.
G—Three-way stopcock with TFE-fluorocarbon plug.
H—Flask containing treating solution.
I—Glass joint with O-ring leading to either vacuum gage or manometer.
J—Glass joint with O-ring.
K—Flask for vacuum trap.
L—Stopcock to atmosphere.
M—Line to source of vacuum.

FIG. 1 Apparatus for Vacuum Impregnation