



Designation: D2921 – 98 (Reapproved 2017)

Standard Test Method for Qualitative Tests for the Presence of Water Repellents and Preservatives in Wood Products¹

This standard is issued under the fixed designation D2921; 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.

1. Scope

1.1 This test method covers simple qualitative field or laboratory tests to determine water repellency or the presence of chlorinated phenol² preservative chemicals in wood products that are specified to be water repellent preservative treated.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

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.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *U.S. Federal Specification:*

TT-W-572 Wood Preservative Water-Repellant³

2.2 *NIST Standard:*

262-63 Water Repellent Preservative Non-Pressure Treatment for Mill Work⁴

3. Significance and Use

3.1 Although chlorinated phenol-treated wood has become less common due to environmental concerns, repellent-treated wood is commonly specified in construction. This test method

provides a means to verify the presence of a significant level of water repellent protection.

4. Apparatus

4.1 *Eyedropper*, plastic squeeze bottle or similar means for metering drops of water.

4.2 *Flame Source*, such as bunsen burner, butane torch, or alcohol burner.

4.3 *Copper Wire Coil Specimen Holder (or Other Suitable Copper Holder)*—A suitable copper wire coil can be made by using a lead pencil as a mandrel to form a helix using copper wire of about 1.6 to 2.4 mm ($1/16$ to $3/32$ in.) in diameter. Leave a space of approximately the diameter of the wire between each loop. The helix should be 19 to 25 mm ($3/4$ to 1 in.) in length. Leave a pigtail of about 152 mm (6 in.) of wire at one end of the helix and form a loop of approximately 25 mm (1 in.) in diameter to be used as a holder for the coil.

4.4 *Sharp Knife*.

5. Water Repellent Test

5.1 Place uncut wood items to be tested so that the end grain is exposed as a horizontal surface. If the end grain cannot be so positioned, comparisons can be made on the flat grain but with less definitive results.

5.2 With an eye dropper, or similar device, allow several drops of water to fall from about 13 mm ($1/2$ in.) on the end grain of the wood. Wait 5 min and then observe the degree of penetration. With flat grain or vertical grain surfaces, waiting periods of 10 to 15 min may be necessary.

5.3 Water drops that immediately flatten out, penetrate and darken the wood, indicate that the wood has not been treated with a water repellent.

5.4 Water drops that “bead-up” and remain as spheres, with little or no color change or penetration, indicate that the wood has been treated with a water repellent. Water repellent preservatives, meeting Fed. Spec. TT-W-572 and NBS Standard 262-63, impart sufficient water repellency to the end grain of wood to cause water drops to bead up and form spheres.

6. Preservative Test

6.1 Chlorinated phenol based wood preservatives emit a characteristic green flame upon pyrolysis within a ventilated

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.52 on Factory Coated Wood Products.

Current edition approved July 1, 2017. Published July 2017. Originally approved in 1970. Last previous edition approved in 2011 as D2921 – 98 (2011). DOI: 10.1520/D2921-98R17.

² Pentachlorophenol, tetrachlorophenol and other chlorinated phenols.

³ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

⁴ Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 1070, Gaithersburg, MD 20899-1070, <http://www.nist.gov>.

copper envelope due to the release of chlorine and its consequent reaction with copper (Beilstein's test). Untreated wood produces a yellow-orange flame but any chlorine containing compound will give a positive test.

6.2 Using the copper wire specimen holder, described in 4.3, hold the coil portion in the flame until it burns with a characteristic yellow-orange color. This preheated coil is then allowed to cool.

6.3 With a knife, cleaned by heating after each use, cut a splinter from the specimen of wood to be tested. Samples should be taken near the end of the wood items where end grain is exposed and where normal concentration of the preservative chemicals is greatest. The size of the wood sample should be smaller than the length and inner diameter of the coil.

6.4 With the copper coil held horizontally, place the splinter in the center of the coil. Put the copper coil with wood splinter in the flame and burn. If chlorinated phenols are present, the characteristic green flame is produced. Untreated wood produces the yellow-orange flame.

7. Accuracy

7.1 The tests are less accurate on flat grain and the heartwood of some wood species, so that end grain and sapwood should be used whenever possible.

7.2 Tests on both a known untreated sample and a treated sample of the same wood species will provide comparison standards for the operator and will improve the accuracy of the tests.

7.3 Test results are improved if tests are made with wood samples taken from the center of a stack or from a protected area where the possibility of contamination is least. Untreated items which come in physical contact with preservative treated products during handling and shipping may show slight evidence of the preservative chemical.

7.4 More than one wood sample obtained from different areas from the unknown piece should be tested.

8. Precision and Bias

8.1 *Precision*—No numerical statement of precision is possible in this qualitative test method. One hundred percent agreement was obtained in a round-robin test.

8.2 *Bias*—Bias has not been determined.

9. Keywords

9.1 chlorinated phenols; water repellents; wood preservatives; wood products

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, Tel: (978) 646-2600; http://www.copyright.com/