

TT-W-572 – FUNGICIDE: PENTACHLOROPHENOL

Subject/Scope:

This specification covers materials that combine water-repellent and preservative properties of ready-to-use solutions for treatment of wood by simply non-pressure methods (see 6.1). Composition C is intended for tropical conditions or where maximum protection from a simple application is needed and should be specifically requested. Composition D is intended for uses only where food stuff may contact treated wood.

Keywords:

Treat, fed, test, method, water, untreated, standard, solution, wood, container, shipping, adhesion, treatment, packing, pressure, packaging, sampling, inspection

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Text in blue boxes such as this one is instructional and is intended to assist you in understanding the document.

Text in red boxes such as this explains changes made to the document by The Wooden Crates Organization.

Red text has been added to the document or modifies the document since its final version was officially published.

Soft Conversion of Imperial to Metric

Conversions, when made, consider materials that are available in metric or imperial sizes rather than converting sizes exactly. For example: Panelboard (plywood) in the US is typically 4 feet X 8 feet (1220 x 2440 mm) while panelboard in metric countries is typically 1200 X 2400 mm. Since the standard was developed based on readily available materials these variations in material sizes could not have been practically considered.



Amendment 2 indicated a modification to the title. – This change is reflected in the title above.
Amendment 2 also indicates a document reference code change that is not significant to the documents use.

The content of the document below has not been modified.

TT-W-572B
May 28, 1969

SUPERSEDING

Int. Fed. Spec. TT-W-00572a (AGR-PS)
January 23, 1968 and
Fed. Spec. TT-W-572
February 29, 1952

FEDERAL SPECIFICATION

WOOD PRESERVATIVE: WATER-REPELLENT

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers materials that combine water-repellent and preservative properties of ready-to-use solutions for treatment of wood by simply nonpressure methods (see 6.1). Composition C is intended for tropical conditions or where maximum protection from a simple application is needed and should be specifically requested. Composition D is intended for uses only where food stuff may contact the treated wood.

1.2 Classification. The wood preservative covered by this specification shall be of the following compositions, as specified (see 6.2):

Composition A - Pentachlorophenol.
Composition B - Copper naphthenate.
Composition C - Copper naphthenate (high concentration).
Composition D - Copper-8-quinolinolate.

2. APPLICABLE DOCUMENTS

2.1 Specification and standards. The following specifications and standards of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

Federal Specifications:

TT-P-25 - Primer Coating, Exterior (Undercoat for Wood, Ready-Mixed, White and Tints).
TT-T-291 - Thinner, Paint, Volatile Mineral Spirits (Petroleum-Spirits).
TT-W-570 - Wood-Preservative; Pentachlorophenol.
PPP-B-636 - Box, Fiberboard.
PPP-C-96 - Cans, Metal, 28 gage and lighter.
PPP-D-729 - Drums: Metal, 55-gallon (for shipment of noncorrosive material).
PPP-P-704 - Pails, Metal: (Shipping, steel, 1 through 12 gallon).

Federal Standards:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civilian Agencies).
Fed. Test Method Std. No. 141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling, and Testing.

(Activities outside the Federal Government may obtain copies of Federal Specification, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Washington, D. C., Atlanta, Chicago, Kansas City, Mo., Fort Worth, Denver, San Francisco, Los Angeles, and Auburn, Washington.)

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Standards:

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply:

American Wood-Preservers' Association (AWPA) Standards:

- A5 - Standard Methods for Analysis of Oil-Borne Preservatives.
- P8 - Standards for Oil-Borne Preservatives.

(Application for copies should be addressed to the American Wood-Preservers' Association, 1012 - 14th Street, N. W., Washington, D. C. 20005.)

Uniform Freight Classification Rules:

(Application for copies should be addressed to the Uniform Classification Committee, 202 Union Station, Chicago, Ill. 60606.)

National Motor Freight Classification Rules:

(Application for copies should be addressed to the National Classification Board, 1616 P. St., N. W. Washington, D. C. 20036.)

3. REQUIREMENTS

3.1 Homogeneity and stability. The treating solution shall be stable and homogeneous. All ingredients shall remain in solution without curdling, livering, sludging, or precipitation under normal shipping and working conditions and when stored in closed containers for at least 6 months. A congealed condition while at low temperatures is not objectionable, provided the material readily becomes fluid when restored to normal working conditions. When tested in accordance with 4.3.7, not over 10 milliliters of sludge shall be deposited when centrifuged and not over 1 milliliter of solid precipitate or insoluble resin shall be deposited after 2 weeks of exposure to air.

3.2 Odor. The odor shall not be unusually offensive.

3.3 Color. Solutions of compositions A and D (see 1.2) ^{1/} shall not unduly change the color of the wood to which they are applied and shall have a Gardner color rating not to exceed 12 when tested in accordance with 4.3.1.

3.4 Solvents. The principal solvent used in the water-repellent preservative solution shall be a light petroleum solvent complying with Grade 1 Thinner of TT-T-291. The supplier shall furnish an affidavit stating that this product contains not less than 80 percent ^{2/} of this solvent by volume. Cosolvents are permitted to increase pentachlorophenol solvency and to prevent "blooming."

3.5 Flash point. The flash point of the solution shall be not less than 100°F. when tested in accordance with 4.3.2.

3.6 Preservative chemicals.

^{1/} Compositions B and C impart a green color to the wood.

^{2/} Sixty-five percent for composition C.

3.6.1 Composition A. The pentachlorophenol used in the treating solution shall comply with TT-W-570 and the treating solution shall contain 5 percent by weight but not less than 159 grams of pentachlorophenol per gallon at 60°F. when determined by the method in 4.3.3.1.

3.6.2 Compositions B and C. The copper naphthenate used in the treating solution shall comply with AWPA Standard PB. The treating solution for composition B shall contain 1 percent copper but not less than 34 grams of copper per gallon at 60°F., and the treating solution of composition C shall contain 2 percent copper but not less than 68 grams per gallon at 60°F., as determined by the method in 4.3.3.2.

3.6.3 Composition D. The copper-8-quinolinolate used in the treating solution shall comply with AWPA Standard PB and the treating solution shall contain at least 0.045 percent copper but not less than 1.45 grams of copper per gallon at 60°F. as determined by the method in 4.3.3.3.

3.7 Water-repellency. The effectiveness of the treating solution in reducing the swelling of wood shall be not less than 60 percent when tested by the method in 4.3.4.

3.8 Paintability. The treating solution shall pass the test for drying and adhesion of paints prescribed in 4.3.6. Since paintability of a treated wood surface will vary with different species, paint systems, and conditions related to specific products, the Government user is urged to modify the painting requirement for adaptability to specific needs. The surface of the treated wood, 72 hours after treatment, shall be free from waxy, greasy, or oily deposit removable by rubbing with the finger, and free from any glossy film resembling that of a varnish.

3.9 Drying time. When tested in accordance with 4.3.6, the surface of the treated wood shall be free from tack 72 hours after treatment.

3.10 Viscosity. The viscosity of the solution shall not exceed 0.0624 stokes (A4) when tested in accordance with 4.3.8.

3.11 Surface deposits. The preservative shall leave no "bloom" or crystalline deposit when tested in accordance with 4.3.5.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to the prescribed requirements.

4.2 Sampling for inspection. From each inspection lot the Government inspector shall take two containers at random. From each of the two containers 1-gallon specimens shall be taken and placed in separate, clean, dry, metal or glass containers, sealed, marked, and forwarded to the testing laboratory designated by the bureau of agency concerned.

4.2.1 Inspection of preparation for delivery. An inspection shall be made to determine that the preservative, packaging, packing, and marking comply with the requirements in section 5 of this specification. Defects shall be scored in accordance with table I. For examination of interior packaging the sample unit shall be one shipping container fully prepared for delivery, selected at random just prior to the closing operations. Sampling shall be in accordance with MIL-STD-105. Defects of closure listed shall be examined on shipping container fully prepared for delivery. The lot size shall be the number of shipping containers in the end item inspection lot. The inspection level shall be S-2 with an AQL of 4.0 defects per hundred units.

TABLE I. Classification of preparation for delivery defects

Examine	Defects
Markings (exterior and interior)	Omitted; incorrect; illegible; improper size, location, sequence, or method of application.
Materials	Any component missing or damaged.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, inadequate stapling, or distortion of container.

4.3 Tests.

4.3.1 Color. The solutions shall be tested in accordance with method 4248 of Fed. Test Method Std. No. 141.

4.3.2 Flash point. The solutions shall be tested in accordance with method 4291 of Fed. Test Method Std. No. 141.

4.3.3 Preservative chemicals.

4.3.3.1 Pentachlorophenol. The determination of pentachlorophenol in the treating solution, in the absence of chlorine other than that in the pentachlorophenol, shall be made in accordance with method 5 of ANPA Standard A5. When other sources of chlorine are present, method 6 of that Standard shall be used and the result, in grams per gallon of solution, should be multiplied by a correction factor of 1.1.

4.3.3.2 Compositions B and C. Copper naphthenate. The determination of copper shall be made in accordance with the method of ANPA Standard A5.

4.3.3 Preservative chemicals.

4.3.3.1 Pentachlorophenol. The determination of pentachlorophenol in the treating solution, in the absence of chlorine other than that in the pentachlorophenol, shall be made in accordance with method 5 of ANPA Standard A5. When other sources of chlorine are present, method 6 of that Standard shall be used and the result, in grams per gallon of solution, should be multiplied by a correction factor of 1.1.

4.3.3.2 Compositions B and C. Copper naphthenate. The determination of copper shall be made in accordance with the method of ANPA Standard A5.

4.3.3.3 Composition D. Copper-8-quinolinolate. The determination of copper shall be made in accordance with the method of ANPA Standard A5 for copper in copper naphthenate solution.

4.3.4 Water-repellency. The test block wafers used for the tests shall be made from straight-grained, clear, average density, flat-grain, kiln-dried ponderosa pine sapwood ¹/₂ boards. The boards shall be machined to 1-1/2 by 10 inches and wafers cut 1/4 inch in length.

One pair of adjacent, end-matched wafers shall be cut from each of five different boards (10 wafers in all). The wafers shall be numbered for identification, stored on a raised screen or rack, and conditioned to constant weight at a controlled temperature of 85°F. and relative humidity of 65 percent. One of the conditioned, end-matched wafers from each pair shall be used as a control and tested without treatment. The other shall be tested after removal from the conditioning chamber and immersion for 30 seconds in the preservative followed by drying with free access to air for 4 days to permit evaporation of solvents. The treated wafers shall then be returned to the conditioning chamber with the control wafers and conditioned together to constant weight.

The test shall be made by comparing the swelling of the treated wafers with that of the untreated control wafers after each has been immersed in water. The swelling shall be measured by means of the swellometer (illustrated in fig. 1). With the dial gage removed from the instrument, the wafer is inserted in the guides. The dial is replaced and the wafer is placed so that one end bears firmly on the adjusted base and the other end contacts the plunger of the dial. A reading of the dial is made before immersion in water and the instrument is arranged in a container of distilled water at 75° ± 5°F. so the wafer is completely submerged (but the dial is dry) for 30 minutes at which time the second dial reading is taken and the difference is noted. The procedure is repeated with each of the five untreated control wafers and matching five treated wafers using fresh water each time.

The percentage water-repellent effectiveness of the preservative shall be determined by dividing the difference between the swelling of the treated wafer and the swelling of the end-matched untreated control wafer of each pair by the swelling of the untreated wafer of the pair in the same interval. The average of the five pairs multiplied by 100 should meet the minimum requirement in 3.8.

¹/Selection of sapwood can be assured by mixing equal parts of (1) a solution of 5 grams of benzidine in 25 grams of hydrochloric acid and 970 grams of water and (2) a solution of 10 percent sodium nitrite, and applying to end-grain wood surfaces. The sapwood immediately shows a yellow color, while the heartwood turns dark red-brown.

4.3.5 Surface deposits. (for composition A only). Place three surfaced 1- by 1- by 1-inch test blocks of heartwood redwood (Sequoia sempervirens) into three separate 3-inch-diameter aluminum weighing dishes with the end-grain surfaces in the top and bottom position. The preservative solution of composition A should be poured into the dishes to a depth of approximately 1/4 inch. Place two of the dishes into a ventilated drying oven heated to a temperature of 100°C. Remove one dish after 1 hour and the other after 2 hours, but before complete evaporation of the solution has occurred. In all of the above cases, expose the test blocks in the dishes at room temperature for 7 days, at which time the block surfaces, when examined under a bright light with a 10X hand lens, should be free of crystalline pentachlorophenol (blooming).

4.3.6 Paintability and drying time. When the wood species and the primer paint coat (or stencil paint) are definitely known by the Government purchaser, these materials shall be mentioned in invitation for bids and shall be used in the paintability and drying time tests. Otherwise, the species for these tests shall be ponderosa pine and the test paint shall conform to the requirements of TT-P-25.

Prepare three pairs of wood test specimens, 2-1/2 inches wide and 12 inches long, with a thickness of from 1/2 to 1 inch. The specimens shall be of flat-grain material, containing significant proportions of sapwood and heartwood, dried to a moisture content not to exceed 20 percent, and surfaced four sides. Each pair shall consist of two end-matched specimens from the same board, and each of the three pairs shall be cut from different boards. One end-matched specimen from each pair shall be used as a control and painted without treatment. The matching specimen from each pair shall be immersed in the treating solution for 3 minutes. The three treated specimens shall then be set in a flat position supported on glass rods and allowed to dry for 72 hours at room temperature in circulating air. The treated specimens shall then be examined for compliance with 3.9 and for the presence of a glossy film, and waxy, greasy, or oil surface deposits under 3.8. Apply to the entire top surface of the three treated and the three matching untreated control specimens, one brush coating (3 wet mils) of either the primer selected or that conforming to the requirements of TT-P-25. Allow the coating to dry in a sunlit location, preferably exterior, free of dew or rainfall for 48 hours. The treated and untreated specimens should be observed and compared for paint drying discoloration and adhesion. When subjected to a cheesecloth-covered thumbprint twist (approximately 180°) under a pressure of approximately 10 pounds (this can be determined with a 10-pound weight on a torsion balance or platform scales), the tackiness and adhesion of the paint coating on the treated specimens shall compare favorably with that applied to the matching untreated control specimens. The color and appearance of the coatings on the treated surfaces should also compare favorably with those on the untreated controls.

4.3.7 Sludging. Place 40 milliliters of the treating solution in a 50-milliliter centrifuge tube with conical bottom and a graduated scale, chill to 32 to 35 F. by placing in a refrigerator for at least 1 hour, then quickly place in a centrifuge, and rotate for 3 minutes at 2,000 r.p.m. with the meniscus approximately 7 centimeters from the axis of rotation. After centrifuging, read the volume of precipitate by means of the graduated scale.

Place 100 milliliters of the treating solution in a 250-milliliter low-form beaker of nontransparent type such as stainless steel and allow to remain standing for 2 weeks uncovered at a temperature between 75° and 100°F. The beaker should be covered with a watch glass in such a way that dust will be kept out but air can still enter. Three 2-inch bent sections of a small glass rod hung over the lip of the beaker will usually suffice. After 2 weeks, if solids are thrown down, stir the contents of the beaker to resuspend them. Place in a centrifuge and treat the unchilled sample as above with the 40-milliliter sample (see 3.1).

4.3.8 Viscosity. The solutions shall be tested in accordance with method 4271 of Fed. Test Method Std. No. 141.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A, B, or C, as specified (see 6.2).

5.1.1 Level A. The preservative shall be furnished in 1 gallon cans conforming with PPP-C-96, type V, class 2; 5-gallon steel containers conforming with PPP-P-704, type I, class 1, 2, 3, 4, 5, or 8; or in 55-gallon steel drums conforming with PPP-D-729, type I or II (see 6.2). The 5 gallon pails shall be furnished with pour spouts.

5.1.2 Level B. The level B packaging shall comply with 5.1.1, except commercial exterior coating are acceptable (see 6.2).

5.1.3 Level C. The preservative shall be furnished in 1-gallon cans, 5-gallon steel containers or in 55-gallon steel drums normally furnished for commercial practice (see 6.2).

5.2 Packing. Packing shall be level A, B, or C, as specified (see 6.2).

5.2.1 Level A. The filled 1-gallon cans shall be packed in quantities of 4 in a close-fitting box conforming with PPP-B-636, class weather-resistant. Closure shall be in accordance with the appendix of the box specification. The 5 and 55-gallon containers require no over-packing.

5.2.2 Level B. The level B packing shall comply with 5.2.1, except that the box shall conform to PPP-B-636, class domestic.

5.2.3 Level C. The preservative shall be packed in a manner which will insure arrival at destination in satisfactory condition and which will be acceptable to the carrier at the lowest rates. Containers and packing shall comply with Uniform Freight Classification Rules or National Motor Freight Classification Rules. The preservative shall be furnished in 1-gallon cans, 5-gallon steel pails, or 55-gallon steel drums, as specified (see 6.2).

5.3 Marking.

5.3.1 Civil agencies. In addition to any special marking required by the contract or order, shipping containers shall be marked in accordance with Fed. Std. No. 123.

5.3.2 Military agencies. In addition to any special markings required by the contract or order, shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The solutions covered by this specification are intended primarily for the treatment of wood products that usually require painting or stenciling such as millwork, containers, and the like, or, in emergency situation, to treat lumber for long storage in the open, by simple, non-pressure methods without heating above the flash point of the solvents. Such treatments provide a moderate degree of resistance to shrinking and swelling and to fungi when applied to wood products that are exposed intermittently to rain wetting. They do not provide adequate protection to wood used under severe exposure conditions such as those entailing ground contact or prevalent extensive periods of wetting. Wood products for such use should be treated in accordance with the latest revision of TT-W-571, Wood Preservative; Recommended Treating Practice.

These preservatives generally present a problem of paintability if applied by pressure or other impregnation treatment.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- (a) Title, number, and date of this specification.
- (b) Composition of product desired (see 1.2).
- (c) Selection of applicable levels of packaging and packing required (see 5.1 and 5.2).
- (d) Size of container required (see 5.1.1, 5.1.3, and 5.2.3).
- (e) Containers for level B packaging to be supplied with commercial exterior coatings, if required (see 5.1.2).

6.3 Basis of purchase. The material should be purchased by volume, the unit being a U. S. gallon at 60°F. For the purpose of awarding contract, comparisons of costs should be made on the basis of the treating solution prepared for use according to the directions of the contractor.

6.4 Precautionary measures.

6.4.1 Stirring. Before it is used, water-repellent preservative should be warmed if necessary and agitated thoroughly.

6.4.2 Fire hazard. The solvent or thinner used in these water-repellent preservatives may have a flash point as low as 100°F. (37.8° C.) and care should be taken to prevent fire. No smoking, welding, or other source of fire should be permitted near the treating operation or near treated material until after 24 hours of drying under conditions of adequate ventilation to insure removal of inflammable vapors. Treating should be done out of doors or in a thoroughly ventilated room. Adequate precautions from the standpoint of fire should be taken in storing the preservative.

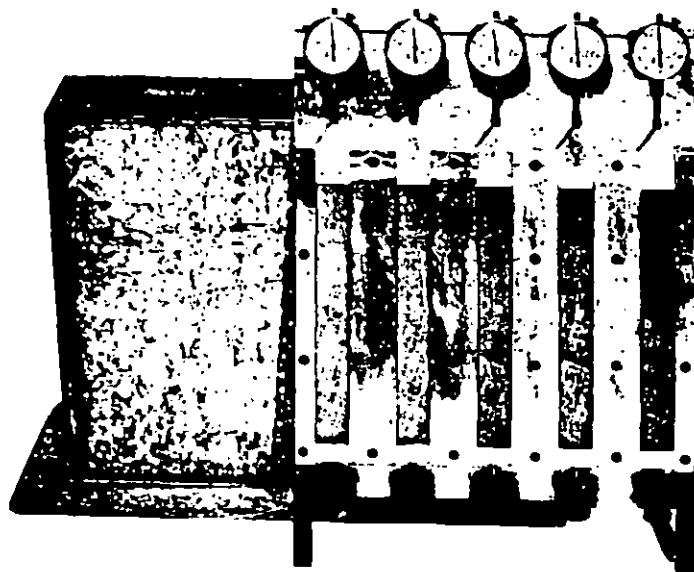


FIGURE 1. Swellometer test equipment.

6.4.3 Irritating effect. Some of the ingredients used in water-repellent preservatives are irritating to the skin, and workmen differ greatly in their sensitivity to them. Adequate ventilation and other protective measures should be provided. The use of protective ointments and of gloves and aprons made of or coated with oil-resistant synthetic rubber is helpful. If applied by spraying, goggles and respirators should be worn. Workmen should be instructed to avoid the use of clothing soiled with these water-repellent preservatives and also to wash well with soap and water after contact with these solutions.

6.5 Preservative solutions in commonly used commercial solvents are relatively noncorrosive to common metals.

Military Coordinating Activity:

NAVY-YD

Preparing activity:

AGR - FS

Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of the general specification to obtain extra copies and other documents referenced herein. Price of this specification sheet 10 cents each.

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

VENDOR

USER

MANUFACTURER

OTHER (Specify): _____

b. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YYMMDD)

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)