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## FEDERAL SPECIFICATION

### WOOD PRESERVATION: TREATING PRACTICES

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

#### 1. SCOPE

1.1 Scope. This specification covers the pressure treatment with various preservatives of wood of different forms and species. It also covers the thermal process (hot and cold) treatment of some species of poles as shown in tables I and II.

#### 2. APPLICABLE DOCUMENTS

2.1 Specifications and standards. The following documents of the issue 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-C-645 - Creosote, Coal Tar, Technical.
- TT-C-655 - Creosote, Technical, Wood Preservative, (For) Brush, Spray, or Open-Tank Treatment.
- TT-C-650 - Creosote-Coal Tar Solution.
- TT-W-535 - Wood Preservative; Fluor Chrome Arsenate Phenol Mixture.
- TT-W-546 - Wood Preservative; Acid Copper Chromate Mixture.
- TT-W-549 - Wood Preservative; Ammoniacal Copper Arsenite Mixture.
- TT-W-550 - Wood Preservative; Chromated Copper Arsenate Mixture.
- TT-W-551 - Wood Preservative; Chromated Zinc Chloride Mixture.
- TT-W-568 - Wood Preservative; Creosote-Petroleum Solution.
- TT-W-570 - Wood Preservative; Pentachlorophenol, Solid.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications, Standards, and Handbooks, and at the prices indicated in the Index. The Index, which includes cumulative monthly supplement 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 Seattle, Wash.

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

2.2 Other publications. Where detailed requirements are not covered in this specification, 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.

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American Wood Preservers' Association (AWPA) Standards:

- A1 Standard Methods for Analysis of Creosote and Oil-Type Preservatives.
- A2 Standard Methods for Analysis of Water-Borne Preservatives and Fire-Retardant Formulations.
- A3 Standard Methods for Determining Penetration of Preservatives and Fire Retardants.
- A4 Standard Methods for Sampling Wood Preservatives.
- A5 Standard Methods for Analysis of Oil-Borne Preservatives.
- A6 Methods for the Determination of Oil-Type Preservatives and Water in Wood.
- A7 Standard Wet Ashing Procedure for Preparing Wood for Chemical Analysis.
- A8 Qualitative Recovery of Creosote or Creosote-Coal Tar Solution From Freshly Treated Piles, Poles, or Timber (Squeeze Method).
  
- C1 All Timber Products--Standard for Preservative Treatment by Pressure Processes.
- C2 Lumber, Timbers, Bridge Ties, and Mine Ties--Preservative Treatment by Pressure Processes.
- C3 Piles--Preservative Treatment by Pressure Processes.
- C4 Poles--Preservative Treatment by Pressure Processes.
- C5 Posts--Preservative Treatment by Pressure Processes.
- C6 Crossties and Switch Ties--Preservative Treatment by Pressure Processes.
- C8 Standard for the Full-Length Thermal Process Treatment of Western Red Cedar Poles.
- C9 Standard for the Preservative Treatment of Plywood by Pressure Processes.
- C10 Lodgepole Pine Poles--Preservative Treatment by the Full-Length Thermal Process.
- C23 Pole Building Construction--Preservative Treatment by Pressure Processes.
- C28 Standard for Preservative Treatment of Structural Glued Laminated Members and Laminations Before Gluing of Southern Pine, Pacific Coast Douglas-fir, and Western Hemlock by Pressure Processes.
  
- M2 Standard for Inspection of Treated Timber Products.
- M4 Standard for the Care of Pressure-Treated Wood Products.
- M5 Glossary of Terms Used in Wood Preservation.
- M6 Brands Used on Forest Products.
  
- P4 Standard for Petroleum Oil for Blending With Creosote.
- P9 Standard for Hydrocarbon Solvents for Oil-Borne Preservatives.

(Copies of the Standards and Instructions of the American Wood-Preservers' Association may be obtained from its Secretary-Treasurer, 1012-14th Street, N.W., Washington, D.C. 20005. Prices may be obtained from the Secretary-Treasurer.)

Technical society and technical association specification standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.

### 3. REQUIREMENTS

3.1 Segregation of material for treatment. The material shall be separated or spaced so as to insure contact of treating medium with all surfaces. Whenever the quantity of material ordered is sufficient, items of different species, size, conditioning, and retention requirements shall be treated in separate charges. Round material and sawn material shall not be treated in the same charge.

3.2 Empty- and full-cell processes. Empty-cell treatment shall be used with preservative oils and oil-borne preservatives except when the retention specified is greater than can be obtained by an empty-cell process. Water-borne preservatives shall be injected by the full-cell process. Control over wood temperature is essential in treating wood with water-borne preservatives containing chromates which are unstable in contact with wood at high temperatures.

3.3 Seasoning Where checking in use may have serious consequences, material shall be adequately seasoned before it is placed in the retort or after it is placed in the retort, but before impregnation with preservative. This practice applies particularly to sawn material that is difficult to penetrate and to round material of thin sapwood species. All lumber that is to be treated with an oil-type preservative and used in buildings or other places where high moisture content or shrinkage after installation would be objectionable shall be dried before treatment. When treated with a water-borne preservative, lumber shall be dried after treatment to a moisture content consistent with end use as specified by the purchaser (see 6.2).

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3.4 Incising. All lumber and timbers of species that are difficult to penetrate, such as Douglas-fir, western larch, western hemlock, redwood, and pines that are predominantly heartwood, shall be incised. When specified (see 6.2), incising the fabricated material that would be seriously damaged thereby may be omitted. In such case, treatment shall be to refusal as defined in AWPA Standard M5 with the maximum pressure and temperature permitted for the species in AWPA Standard C2 being used. In such case, penetration and retention requirements will be waived.

3.5 Branding. Unless otherwise specified (see 6.2), treated material shall be either branded, rubber stamped, or metal tagged to identify the species, preservative, retention, supplier, and year of treatment in accordance with AWPA Standard M6 and the following instructions:

3.5.1 Poles 50 feet or less in length shall be branded or tagged 10 feet from the butt. Poles 55 feet or more in length shall be branded or tagged 14 feet from the butt.

3.5.2 Piles shall be branded or tagged in two places approximately 5 and 10 feet from the butt.

3.5.3 Posts shall be branded or tagged at or within 12 inches of the top.

3.5.4 Crossties shall be branded on one or both ends.

3.5.5 All lumber 1 inch by 4 inches (nominal) and larger treated with a water-borne preservative shall be stamped; if treated with an oil-type preservative, it shall be branded. All timbers shall be branded.

3.5.6 Plywood, if treated with an oil-type preservative, shall be branded; and, if treated with a water-borne preservative, shall be stamped.

3.6 General requirement. Unless otherwise specified in the contract or purchase order (see 6.2), the treatment of various products and species shall be in accordance with tables I, II, and III and footnotes thereto.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein, and complete inspection records shall be furnished to the purchaser's office or otherwise as stipulated in the order or contract.

4.1.1 Unless otherwise specified, the inspection shall be made at the production point.

4.1.2 Inspection of the untreated stock shall be made in a period within 10 days of treatment.

4.1.3 Except as otherwise specified, the supplier may utilize his own or any other inspection facilities and services acceptable to the Government.

4.1.4 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 prescribed requirements.

4.1.5 If inspection is made at destination, it will be made within 30 days of delivery and certain tolerances will be permitted in the retention and in the quality of oil extracted from marine piling (see footnote 1 to tables I, II, and III, and footnote 8 to table I).

4.2 Instructions. Standard Instruction M2 of the American Wood Preservers' Association shall be used in the inspection and testing of the treated material.

4.2.1 In piling treated with creosote or solutions containing creosote, retentions by assay are based on the extraction of preservative oil from a sample of borings taken from the approximate mid-point of piles that meet penetration requirements, the piles to be bored being representative of those accepted. AWPA Standard A6 shall be followed in the extraction. If treated with pentachlorophenol, the borings shall be analyzed according to AWPA Standard A5. The number of borings from any lot shall be according to the following schedule: Lots of 30 or more-30 borings from 30 representative piles; lots of 15 to 29-one boring from each pile; lots of less than 15-not less than 20 borings with an equal number of borings from each pile. The borings shall be cut to the proper length for the species, as shown in tables I and II. The results obtained on charges treated with creosote-coal tar solution shall be multiplied by a factor of 1.06 to correct for the toluene-insoluble material remaining in the wood.

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Whenever an individual pile has an appearance indicating that it has received a seasoning differing widely from that of the other piles in the charge, or when the appearance of borings leads to doubt as to adequacy of retention, that pile shall be set aside for an individual assay, and a boring from that pile shall not be added to the composite sample for the charge. A sample of eight borings shall be taken in a spiral pattern around the approximate midpoint of a pile that is being checked individually. The borings shall be cut to the proper length for the species and the sample assayed.

4.2.2 To obtain and test a sample of oil from a marine piling, AWPA Standards A8 and A1 shall be used.

## 5. PREPARATION FOR DELIVERY

5.1 This section is not applicable to this specification.

## 6. NOTES

6.1 Recommended practices in the procurement and use of treated wood.

6.1.1 Tables I, II, and III are schedules of approved practices for the preservative treatment of wood in various forms with creosote and solutions containing creosote, pentachlorophenol, and water-borne preservatives and intended for Government use. The net retentions in the tables are minima. Higher net retentions may be needed for severe use conditions and should be specified when applicable.

6.1.2 Coal-tar creosote, creosote-coal tar solution, creosote-petroleum solution, and pentachlorophenol in heavy petroleum solvent and the three water-borne preservatives, ACA, CCA Type I and CCA Type II (tables I, II, and III) are ordinarily to be used for wood exposed to severe weathering conditions, such as contact with soil or water and for important above-ground structures exposed to the weather. Since oil-type preservatives afford protection against weathering and checking as well as against decay, they are generally preferable to waterborne preservatives for the treatment of sawn wood to be used in contact with the ground. If cleanliness, freedom from odor, or paintability is essential, either of the three waterborne preservatives mentioned above may be expected to give good protection to sawn wood that is selected for its receptiveness to treatment and treated to meet the minimum penetration requirements of footnote 2. Retentions should be at least one-third higher than those recommended for moderate weathering conditions. Pentachlorophenol in a volatile petroleum solvent (table II) is ordinarily to be used in above-ground structures, particularly where cleanliness and paintability are required. All of the water-borne preservatives (table III) are suitable for such use. Pentachlorophenol in a light petroleum solvent is also generally limited to above-ground use especially where moderate cleanliness is desired and freedom from residual solvent is not essential (see 6.1.3). If water repellency also is desired in order to avoid surface damage due to wetting during storage, it should be stipulated by the purchaser. In some harbors, conditions are highly favorable for limnoria, and the life of creosoted piling may be extended by mechanical barriers. AWPA Standard C3 includes a dual treatment that is recommended for trial in harbors where experience has shown that a high limnoria hazard exists.

6.1.3 Painting of treated wood involves special considerations. Wood treated with creosote, solutions containing creosote, and pentachlorophenol in heavy petroleum solvent cannot ordinarily be painted satisfactorily. When requested it can be conditioned by the producer to improve its cleanliness. Difficulties may be encountered in painting wood treated with pentachlorophenol in a light petroleum solvent. Wood treated with water-borne preservatives should be properly seasoned after treatment (see 3.3) and may require light brushing or sanding in order to provide a paintable product. Since "cleanliness" is a relative term, it is recommended that the purchaser make known his specific requirements and the end use of the material, and that the supplier be required to furnish evidence that the material be suitable for that use. In the absence of accepted methods for determining cleanliness, paintability, and water repellency of pentachlorophenol-treated wood, the purchaser may elect to use arbitrary test methods which should be described to the supplier.

6.1.4 Treating solutions of water-borne preservatives may undergo changes in composition as a result of treating operations. Periodic analyses of the stock solution should therefore be made, and, when necessary, the required amounts of the proper ingredients should be added to restore the solution to required composition.

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6.1.5 The serviceability of treated wood is impaired through cutting or damage to the treated surface. Whenever it is possible, machining, cutting, trimming, etc., should be done prior to treatment. When cutting or damage to the surface of treated wood cannot be avoided, the instructions given in AWP Standard M4 should generally be followed. Cut surfaces of lumber should be given at least two brush applications of either creosote or pentachlorophenol in a suitable solvent, or one heavy application of a grease or suitably bodied preservative composition containing 10 percent pentachlorophenol. The choice should be based upon cleanliness requirements.

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) Moisture content required at acceptance (see 3.3).
- (c) When incising must be omitted (see 3.4).
- (d) When treated material is not to be branded (see 3.5).
- (e) Treatment other than normally required (see 3.6).
- (f) When inspection is to be made at destination (see 4.1.6).

6.3 Invitation for bids. Invitations for bids should state the quantity, form, species, grade, and fabrication of the wood, and the preservatives, retentions, and corresponding treatment specifications required and also any special requirements, such as cleanliness, paintability, water repellency, and drying (see 6.1.3). If inspection is to be made at destination, it should be stated.

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TABLE I. Treatment of wood with creosote and solutions containing creosote

Form of product and service conditions	Assay zone	Minimum net retention of preservative <sup>1</sup>				Treating specifications <sup>2</sup> (AWPA Standard C1 and others listed below)
		Coal-tar creosote (Fed. Spec. TT-C-645 or TT-C-655)	Creosote-coal-tar solution (Fed. Spec. TT-C-650)	Creosote-petroleum solution (Fed. Spec. TT-W-568)		
		In.	Pcf.	Pcf.	Pcf.	
<b>Ties</b>						
Cross-ties, switch ties, and bridge ties	gage only	8	8	8	C2 and C6	
<b>Timbers<sup>2</sup></b>						
For use in coastal waters:					C2	
Pacific coast Douglas-fir	...do...	$\frac{3}{14}$	$\frac{4}{14}$	--		
Southern pine	...do...	$\frac{3}{22}$	$\frac{4}{22}$	--		
For use in fresh water, in contact with the ground or for important structural members not in contact with the ground or water	...do...	10	10	12		
For use not in contact with the ground or water	...do...	6	6	7		
<b>Timbers, glued laminated (including laminates prior to gluing)</b>					C2B	
For use in fresh water, in contact with the ground or for important structural members not in contact with the ground or water	(5)	12	12	12		
For use not in contact with the ground or water	(5)	6	6	6		
<b>Lumber<sup>2</sup></b>						
For use in coastal waters:					C2	
Pacific Coast Douglas-fir	0-5/8	$\frac{3}{22}$	$\frac{4}{22}$	--		
Southern pine	0-5/8	$\frac{3}{22}$	$\frac{4}{22}$	--		
For use in fresh water, or in ground contact	0-5/8	10	10	12		
For use not in contact with the ground or water	0-5/8	6	6	7		

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TABLE I. Treatment of wood with creosote and solutions containing creosote (con.)

Form of product and service conditions	Assay zone	Minimum net retention of preservative <sup>1</sup>				Treating specifications <sup>2</sup> (AWPA Standard C1 and others listed below)
		Coal-tar creosote (Fed. Spec. TT-C-645 or TT-C-655)	Creosote-coal-tar solution (Fed. Spec. TT-C-650)	Creosote-petroleum solution (Fed. Spec. TT-W-568)		
	In.	Pcf.	Pcf.	Pcf.		
Plywood					C9	
For use in ground contact	(6)	10				
For use not in contact with the ground or water	(6)	6				
Piles <sup>7</sup>					C3	
For use in coastal waters:						
Pacific Coast Douglas-fir	0-2	<u>3,822</u>	<u>4,825</u>			
Southern pine	0-3					
For land or fresh-water use:						
Douglas-fir	0-2	10	10	10		
Southern and ponderosa pines	0-3	12	12	12		
Jack, lodgepole, and red pines	0-2	12	12	12		
Western larch	0-2	10	10	10		
Oak	0-2	6	6	6		
Poles (round) <sup>7</sup>					C4	
Utility						
Southern and ponderosa pines	0.5-2	<u>10</u> 7.5, 9				
Red pine	.1-1.6	<u>10</u> 10.5, 13.5				
Jack and lodgepole pines	.1-0.75	<u>10</u> 12, 16				
Pacific Coast Douglas-fir	.25-1.0	<u>10</u> 12, 15		<u>10</u> 12, 15 15		
Inland Douglas-fir	.1-0.6	15				
Western larch	.1-0.6	15				
Western redcedar	.1-0.6	16				
Lodgepole pine (thermal)	0-0.5	20			C8	
Cedars (thermal)	0-0.5	20			C23	
Building <sup>2</sup>	0-1.5	15				
Posts (round)					C5	
Fence <sup>7</sup>	0-1.0	6	6	7	C23	
Building <sup>2</sup>	0-1.5	15				

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TABLE II. Treatment of wood with pentachlorophenol solutions

Form of product and service conditions	Assay zone	Minimum net retention of pentachlorophenol (Fed. Spec. 570) <sup>1</sup>				Treating specifications <sup>2</sup> (AWPA Standard C1 and others listed below)
		In 4.5 to 5.5 per- cent solution in heavy petroleum solvent (AWPA P9)	In solution with light petroleum solvent (AWPA P9)	In solution with volatile petroleum solvent (AWPA P9)	In solution with volatile petroleum solvent (AWPA P9)	
		In.	Pcf.	Pcf.	Pcf.	
<b>Timbers<sup>2</sup></b>						C2
For use in fresh water, in ground contact, or for important structural members not in contact with ground or water	gage only		0.5	--	--	
For use not in water nor in ground contact	....do....		.3	0.3	0.3	
<b>Timbers, glued laminated (including laminates before gluing)</b>						C28
For use in ground contact	(5)		.6	--	--	
For use not in water nor in ground contact	(5)		.3	.3	.3	
<b>Lumber<sup>2</sup></b>						C2
For use in fresh water or in ground contact	0-5/8		.5	--	--	
For use not in water nor in ground contact	0-5/8		.3	.3	.3	
<b>Plywood</b>						C9
For use in ground contact	(6)		.5	--	--	
For use not in water nor in ground contact	(6)		.3	.3	.3	
<b>Piles<sup>7</sup></b>						C3
For land or fresh-water use						
Douglas-fir	0-2.0		0.5			
Southern and ponderosa pines	0-3.0		.6			
Jack, lodgepole, and red pines	0-2.0		.6			
Western larch	0-2.0		.5			
Oak	0-2.0		.3			
<b>Poles, (round)<sup>7</sup></b>						C4
<b>Utility</b>						
Southern and ponderosa pines	0.5-2.0	15	.38-0.45			
Red pine	.1-1.6	16	.53-.68			
Jack and lodgepole pines	.1-.75	16	.6-.8			
Pacific coast Douglas-fir	.025-1.0	16	.6-.75			
Inland Douglas-fir	.1-.6		.75			
Western larch	.1-.6		.75			
Western redcedar	.1-.6		.8			
Lodgepole pine (thermal)	0-.5		1.0			C10
Cedars (thermal)	0-0.5		1.0			C8
<b>Building<sup>2</sup></b>	0-1.5		.75			C23
<b>Posts (round)</b>						
Fence <sup>1</sup>	0-1.0		.3			C5
Building <sup>2</sup>	0-1.5		.75			C23

TABLE III. Treatment of wood with water-borne preservatives

Form of product and service conditions	Minimum net retention of solid preservative <sup>1</sup>										Treating specifications	
	Acid copper:chromate (Fed. Spec. IT-W-546)	Ammoniacal:chromated copper arsenite (Fed. Spec. IT-W-550)	Chromated copper arsenate (Fed. Spec. IT-W-551)	Chloride arsenate-phenol mixture (Fed. Spec. IT-W-535)	Chromated zinc chloride arsenate-phenol mixture (AWPA Standard C1 and others listed below)	Fluor-chrome-arsenate-phenol mixture (AWPA Standard C1 and others listed below)	Fluor-chrome-arsenate-phenol mixture (AWPA Standard C1 and others listed below)	Fluor-chrome-arsenate-phenol mixture (AWPA Standard C1 and others listed below)	Fluor-chrome-arsenate-phenol mixture (AWPA Standard C1 and others listed below)	Fluor-chrome-arsenate-phenol mixture (AWPA Standard C1 and others listed below)		Fluor-chrome-arsenate-phenol mixture (AWPA Standard C1 and others listed below)
	in.	Pcf.	Pcf.	Pcf.	Pcf.	Pcf.	Pcf.	Pcf.	Pcf.	Pcf.	Ref.	
Timbers <sup>2</sup>												
For use under moderate <sup>11</sup> weathering conditions	1.00	0.45	0.75	0.45	1.00	0.50						C2
For use in protected locations not in ground contact	.50	.25	.40	.25	.75	.35						
Timbers, glued laminated (including laminates prior to gluing)												C2B
For use under moderate <sup>11</sup> weathering conditions	1.00	.45	.75	.45	1.00	.50						
For use in protected locations not in ground contact	.50	.25	.40	.25	.75	.35						
Lumber <sup>2</sup>												
For use under moderate <sup>11</sup> weathering conditions	1.00	.45	.75	.45	1.00	.50						C2
For use in protected locations not in ground contact	.50	.25	.40	.25	.75	.35						
Plywood												
For use under moderate <sup>11</sup> weathering conditions	1.00	.45	.75	.45	1.00	.50						C9
For use in protected locations not in ground contact	.50	.25	.40	.25	.75	.35						
Poles, round <sup>2</sup>												
Utility												
Southern and ponderosa pines	0.5-2.0	.6	1.0	.6	--	--						C4
Mad pine	1-1.6	.6	1.0	.6	--	--						
Jack and lodgepole pines	1-.75	.6	1.0	.6	--	--						
Pacific Coast Douglas-fir	.25-1.0	.6	1.0	.6	--	--						
Inland Douglas-fir	1-.6	.6	1.0	.6	--	--						
Western larch	1-.6	.6	1.0	.6	--	--						
Western redcedar	1-.6	.6	1.0	.6	--	--						
Building <sup>9</sup>												
For use under moderate <sup>11</sup> weathering conditions	0-1.5	.75	1.2	.75	--	--						C23
Posts, round												
Fence <sup>2</sup>	1.00	.45	.75	.45	--	--						C5
Building <sup>9</sup>	0-1.5	.75	1.2	.75	--	--						C23

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Footnotes for tables I, II, and III

<sup>1</sup> Whenever a method for the determination of retention in a treated product by the assay of a sample is described in an AWPFA specification, purchase shall be made on that basis and a retention by gage shall not be accepted as equal in competitive bids. If inspection is made at destination, AWPFA methods shall be used and an assay retention of 90 percent of the stipulated assay retention shall be accepted as conforming. When an individual pile is assayed (see 4.3) and shows a retention that is more than 25 percent below the specified average retention, it shall be rejected.

<sup>2</sup> These standards cover treatment of species most commonly treated. For species not covered by existing standards the supplier shall furnish evidence of satisfactory experience. Penetration requirements for most generally available products are covered in AWPFA specifications and footnotes below. When penetration is not otherwise specified herein or in AWPFA specifications, the penetration in the sapwood shall be not less than 2-1/2 inches unless 85 percent of the sapwood depth is penetrated (see footnote 9). For wood species not included in AWPFA specifications, the penetration of heartwood faces shall be not less than 3/8 inch in lumber (i.e., sawn material less than 5 inches in thickness) and not less than 1/2 inch in timbers (i.e., sawn material 5 inches or more in thickness) and penetration shall be not less than 1/2 inch in lumber or timbers to be used in coastal waters.

<sup>3</sup> Conforming to class 3 of TT-C-645.

<sup>4</sup> Conforming to class 5 of TT-C-650.

<sup>5</sup> Retentions in timbers shall be determined by gage readings. Retentions in lumber shall be determined by the assay of a sample comprising the 0- to 5/8-inch zone of borings with one boring being taken from each of at least 20 representative pieces of a single lot. Borings shall be taken from the sapwood of southern and ponderosa pines and from the heartwood of Douglas-fir, western hemlock, western larch, and redwood. Retentions in lumber of other species shall be determined by gage. Retentions in glued laminated timbers including laminates before gluing shall be determined by the assay of a sample taken in accordance with AWPFA Standard C28.

<sup>6</sup> Retentions in plywood shall be determined by the assay of a sample taken in accordance with AWPFA Standard C9.

<sup>7</sup> Since difficulty may be encountered in obtaining the specified retention and penetration, it is the responsibility of the supplier to select piles, poles, and posts for treatment that have sufficient sapwood thickness and are suitably conditioned to permit obtaining the retention and penetration specified. For piles to be used in coastal waters, if 15 percent or more fail to meet penetration requirements, the entire charge shall be retreated and reinspected.

<sup>8</sup> When reserve treated stock is assayed or when inspection is made at destination, a sample of the preservative shall be obtained from a randomly selected piling by the procedure given in AWPFA Standard A8. The properties of the recovered oil shall meet the following requirements when tested by AWPFA Standard A1:

Distilling up to 270° C.—not less than 15 percent; distilling up to 355°—not more than 75 percent; minimum specific gravity at 38° C./15.5° C.: 235° to 315° fraction—1.030; 3.5° to 355° C. fraction—1.103; residue above 355° C. for creosote, 1.150; for creosote-coal tar solution 1.180.

<sup>9</sup> Because of the high cost of making replacements in building foundations, a high quality of treatment is essential. This can best be achieved in round members. The design of the building should facilitate periodic inspection of the foundation and reinforcement or replacement of individual members if necessary. In round building poles, or in round posts used in a post-and-beam type of foundation, penetration in each piece 10 inches or less in diameter shall be at least one-half of the radius. In each piece more than 10 inches in diameter, penetration shall be at least 2-1/2 inches.

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<sup>10</sup> The higher retention is required for large poles (group B or over 37.5 inches in circumference), for all poles used under severe service conditions and for all poles having a high replacement cost.

<sup>11</sup> By "moderate weathering conditions" is meant occasional exposure to rainwater but not in contact with the ground except for items of low replacement cost.

**MILITARY INTERESTS:**

Quotations:

Army - ME  
Navy - SH  
Air Force - 84

Review activities:

Army - CE, ME  
Navy - YD  
Air Force - 85

User activity:

Army - AT

Preparing activity:

AGR-FS

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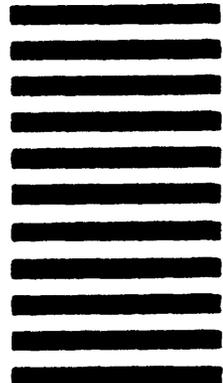
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TT-W-5711  
 AMENDMENT-2  
 October 3, 1972  
 SUPERSEDING  
 Int. Amendment-1 (AGR-FS)  
 April 14, 1971

## AMENDMENT

TO

## FEDERAL SPECIFICATION

## WOOD PRESERVATION: TREATING PRACTICES

This amendment, which forms part of Federal Specification TT-W-5711, dated October 28, 1968 was approved by the Commissioner, Federal Supply Service, General Services Administration for the use of all Federal agencies.

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Table III. Delete, and in its place substitute the new table below.

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Footnote 1. Add the following at the beginning of the paragraph.

"All retentions are based on compositions composed of oxide formulations."

TABLE III. Treatment of wood with water-borne preservatives

Form of product and service conditions	Assay zone	Minimum net retention of solid preservative <sup>1</sup>					Treating specifications <sup>2</sup> (ANPA Standard C1 and others listed below)
		Acid copper chromate (Fed. Spec. TT-W-546)	Ammoniacal copper arsenite (Fed. Spec. TT-W-549)	Chromated copper arsenate (Fed. Spec. TT-W-550) Type I, II, or III	Chromated zinc chloride (Fed. Spec. TT-W-551)	Fluor-chrome-arsenate-phenol mixture (Fed. Spec. TT-W-535) Type I or Type II	
Timbers <sup>2</sup> For use under moderate weathering conditions For use in protected locations not in ground contact.	In.	Pcf.	Pcf.	Pcf.	Pcf.	Pcf.	C2
	gage only	0.50	0.40	0.40	0.61	0.31	
Timbers, glued laminated (including laminates prior to gluing) For use under moderate weathering conditions For use in protected locations not in ground contact	(5)	.50	.40	.40	.61	.31	C28
	(5)	.25	.25	.25	.46	.22	
Lumber <sup>2</sup> For use under moderate weathering conditions	0-5/8	.50	.40	.40	.61	.31	C2

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TABLE III. Treatment of wood with water-borne preservatives (continued)

Form of product and service conditions	Assay scale	Minimum net retention of solid preservative <sup>1</sup>					Treating specifications <sup>2</sup> (ANPA Standard C1 and others listed below)
		Acid copper chromate (Fed. Spec. TT-W-546)	Arsenical copper arsenite (Fed. Spec. TT-W-549)	Chromated copper arsenate (Fed. Spec. TT-W-550) Type I, II, or III	Chromated zinc chloride (Fed. Spec. TT-W-551)	Fluor-chrome-arsenate-phenol mixture (Fed. Spec. TT-W-535) Type I or Type II	
	<u>In.</u>	<u>Pcf.</u>	<u>Pcf.</u>	<u>Pcf.</u>	<u>Pcf.</u>	<u>Pcf.</u>	
For use in protected locations not in ground contact	0-5/8	0.25	0.25	0.25	0.46	0.22	
Plywood							C9
For use under moderate weathering conditions <sup>1a</sup>	(6)	.50	.40	.40	.61	.31	
For use in protected locations not in ground contact	(6)	.25	.25	.25	.46	.22	
Poles, round <sup>2</sup>							C4
Utility							
Southern and ponderosa pines	0.5-2.0	---	.6	.6	---	---	
Red pine	.1-1.6	---	.6	.6	---	---	
Jack and lodgepole pines	.1-.75	---	.6	.6	---	---	
Pacific Coast Douglas-fir	.25-1.0	---	.6	.6	---	---	
Inland Douglas-fir	.1-.6	---	.6	.6	---	---	
Western larch	.1-.6	---	.6	.6	---	---	
Western redcedar	.1-.6	---	.6	.6	---	---	
Building <sup>2</sup>	0-1.5	---	.70	.70	---	---	C23
Posts, round							
Fence <sup>2</sup>	page only	.50	.40	.40	---	---	C5
Building <sup>2</sup>	0-1.5	---	.70	.70	---	---	C23

## MILITARY CUSTODIANS:

Army - ME  
Air Force - 84

## Review Interest:

Army - MD, AT

## User Interest:

Navy - BR, YD

## Military Coordinating Activity

Army - ME

## Preparing activity

AOR - FS