

TECHNICAL SPECIFICATIONS
TREATED WOOD POLES
JPSCO SPECIFICATION NO 4810-S-20

(Effective September 2023)

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"Technical Specification General Requirement forms a part of this specification"

1. **SCOPE**

- 1.1 This specification describes the manufacturing requirements and treatment process of Southern Pine, Jack Pine and Red Pine poles.

2. **GENERAL REQUIREMENTS**

2.1 **INFORMATION**

- 2.1.1 Refer to "Submittal of Information" Section 2, paragraph 2.1 of "Technical Specifications, General Requirements".
- 2.1.2 Purchase orders or contracts will specify the length, class, quantity, species of timber, and type of preservative.

2.2 **GENERAL STIPULATIONS**

- 2.2.1 Under provisions of *RUS Bulletin 1728F-700*.

3. **STANDARDS AND SERVICE CONDITIONS**

3.1 **STANDARDS**

- 3.1.1 Refer to "Codes and Standards" Section 3 of "Specifications and Requirements".
- 3.1.2 The following Codes and Standards as applicable, shall be used in conjunction with this specification.
- 3.1.2.1 ANSI 05.1 - Wood Poles: Specifications and Dimensions.
- 3.1.2.2 *RUS Bulletin 1728F-700 - Specification for Wood Poles, Stubs and Anchor Logs.*
- 3.1.2.3 *AWPA P8-14 - Standard for Oil-Borne Preservatives*
- 3.1.2.4 *AWPA U1-20 - Use Category System: User Specification for Treated Wood*
- 3.1.2.5 Related specifications of AWPA Standards listed in *the RUS Bulletin 1728F-700, Section 2.*

- 3.1.3 If this Specification conflicts in any way with any of the above standards, then the more stringent specification shall take precedence and shall govern. These conflicts shall be indicated by the Bidder within his bid.

3.2 SERVICE CONDITIONS

- 3.2.1 Refer to " Geographic Conditions" Section 4 of " Technical Specifications, General Requirements".

4. DETAILED REQUIREMENTS

4.1 MATERIAL AND MANUFACTURING REQUIREMENTS

4.1.1 Species:

4.1.1.1 Southern Pine (All height and classes)

4.1.1.2 Jack Pine [12m (40 feet) and below]

4.1.1.3 Red Pine [12m (40 feet) and below]

4.1.2 Minimum Fiber Stress:

4.1.2.1 Southern Pine 5, 600 kg/m² (8, 000 lbs/ in².)

4.1.2.2 Jack Pine 4, 480 kg/m² (6, 400 lbs/ in².)

4.1.2.3 Red Pine 4, 200 kg/m² (6, 000 lbs/ in².)

- 4.1.3 Pole classes and lengths, defects (permitted and prohibited), conditioning, seasoning, treatment limitations, rate of growth, insect damage, knots, scars, shakes shape, twist grain, splits and checks, manufacturing requirements (bark removal, sawing, trimming, shaving and incising) storage, and handling shall be according to **ANSI 05.1**.

Exception: Poles that are made from Jack and Red pine of a given class and length shall have the same load-carrying capacity as Southern pine poles of the same height and class and therefore in this respect shall be interchangeable.

4.1.4 *The following information shall be burned or branded legibly and permanently on the pole butt and on the pole face 1.7 m (5' 6") from the ground line of the pole.*

4.1.4.1 The supplier's code or trademark.

4.1.4.2 The true circumference-class numeral and numerals showing the length of the pole.

4.1.4.3 Code letters denoting the pole species, preservative and retention used.

4.1.4.4 Month and the year of treatment.

4.1.4.5 Letter "JPS", not less than 16 mm (5/8") high, denoting ownership.

4.1.4.6 The class number of the pole.

4.1.4.7 Marking at the groundline (2" + 10% of the length of the pole)

4.1.5 The code letters, not less than 16 mm (5/8") high, designating the pole species, preservative and retention used, shall be as follows: -

4.1.5.1 Species Code Letters

Southern Pine (All classes)	SP
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Jack Pine (All classes)	JP
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Red Pine (All classes)	RP
------------------------	----

4.1.5.2 Preservative

Pentachlorophenol	P
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Copper Naphthenate	N
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DCOI	D
------	---

4.1.5.3 Retention

Heavy	H
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4.1.6 The centre of the brand or mark shall be placed squarely on the face of the pole 1.7 m (5'6") and 0.6 m (2') from the ground line, as shown on the "Pole Drilling and Marking Guide" drawing No. 2 2-1 attached to this specification.

4.1.7 Framing

The poles shall be bored, gained and cut to length prior to final treatment, and in accordance with the "*Pole Drilling and Marking Guide*" drawing No. 2, 2-1 attached to this specification. When gains are required on one side only, they shall be cut on the face of the pole; and the gained surfaces shall be in approximately parallel planes. No drilling or gaining is required on poles 17 m (55') and longer.

4.2 PRESERVATIVES

4.2.1 Poles shall be treated full length using Pentachlorophenol or Copper Naphthenate or DCOI subject to the following:

4.2.1.1 Pentachlorophenol - All height and classes poles.

Pentachlorophenol shall contain not less than ninety five percent (95%) chlorinated phenols and conform to AWWA Standards P8-74 when analyzed in accordance with A5-75, Sections 1, 2, 3 and 4. The hydro carbon solvents for introducing the preservative into the wood shall meet the requirements of AWWA Standards P9-74 Type A or B determined in accordance with referenced ASTM standards for physical properties. The treating solution shall contain not less than five (5) percent pentachlorophenol by weight as determined by AWWA standard A5.

4.2.1.2 Copper Naphthenate - All height and class poles.

The acid used in the manufacture of copper naphthenate shall be naphthenic acid of the group of alicyclic carboxylic acids occurring in petroleum and shall have an acid number of not less than 180 on an oil-free basis. The copper naphthenate concentrate used to prepare wood-preserving solutions shall contain not less than 6 percent nor more than 8 percent copper in the form of copper naphthenate, and shall not contain more than 0.5 percent water. All copper present in the concentrate shall be combined as copper naphthenate.

The foregoing tests shall be made in accordance with the standard methods of the American Wood Protection Association. Outlined in AWWA Standards A5, A13, and A41. Solvents used to prepare solutions of copper naphthenate shall comply with the standards of the AWWA Standard P9. The copper naphthenate

concentrate shall not contain more than 2% (relative) of the total copper in the concentrate as being water extractable as determined by AWWA Standard A14.

4.2.1.3 DCOI - All height and classes poles.

Poles treated with DCOI shall have low to no odor. All tests shall be in accordance with American Wood Protection Association (AWPA). The formulation for DCOI is 4,5-dichloro-2-n-octyl-4-Isothiazolin-3-One.

4.3 PRESERVATIVE TREATMENT

4.3.1 Conditioning Prior to Treatment

4.3.1.1 Poles for which air-seasoning is required (ANSI 5.1) shall have been dried by natural air circulation. All air seasoned poles shall be conditioned prior to or during treatment so that the pitch centre of the pole shall have been heated for at least 2 hours at a temperature of not less than 66°C (150°F). The moisture content of poles shall be measured using a resistance type meter and shall not exceed twenty-five percent (25%) at a depth of 64mm (2-1/2") or at the sapwood heartwood line, whichever is less.

4.3.1.2 Red and Jack pine poles which are partially seasoned by natural air circulation shall be air dried within the limits of section 5.1.2.1 of ANSI 5.1. All poles in this category shall be further artificially conditioned prior to treatment by processes such as Boulton drying, steam conditioning or kiln drying or heating in the preservative.

Southern pine poles which are partially seasoned by natural air circulation, kiln drying or shed drying shall be further conditioned by the steam-vacuum process within the limits of section 5.1.2.3 of ANSI 5.1.

The conditioning, seasoning and treatment limitations shall be in accordance with ANSI 5.1, section 5.1.2

4.3.2 Pressure Treatment Process

4.3.2.1 Maximum preservative temperature shall be: -
Preservative

	Temperature	
	°C	(°F)
<i>Pentachlophenol</i>	104	(220)
<i>Copper Naphthenate</i>	104	(220)
DCOI	104	(220)

4.3.2.2 Maximum Impregnation pressure shall be: -

	Impregnation Pressure	
	kg/m ²	(lbs/in ²)
<i>Southern Pine</i>	141 000	(200)
<i>Red & Jack Pine</i>	105 750	(150)

4.3.3. Results of Treatment

4.3.3.1 Penetration and retention of preservative shall be tested on borings taken at any point on the periphery approximately: -

4.3.3.1.1 Within the zone one foot above to one foot below the brand on poles

4.3.4 Retention of Pentachlorophenol preservative shall be as follows:

4.3.4.1 Shall not less than 7.21 kg/m^3 (0.45 pcf) as specified by the following tests in RUS Bulletin 1728F-700.

4.3.4.2 This retention for lime ignition or x-ray spectroscopy method. Copper pyridine method, which equals 90% of lime ignition results, is required when poles may have been in contact with salt water, and for all species native to the Pacific Region, unless it specifically states on the raw material invoice that the material has not been in contact with salt water or shown by analysis that there, are no additional chlorides present in the wood before treating.

4.3.5 Retention of COPPER NAPHTHENATE preservative shall be as follows:

4.3.5.1 Shall not less than 1.28 kg/m^3 (0.08 pcf) as specified by the following tests in RUS Bulletin 1728F-700.

4.3.5.2 Test method shall be lime ignition or x-ray spectroscopy.

4.3.5.3 In Decay Zone 5, shown in RUS Bulletin 1730B-121, minimum retentions are 0.130 PCF for Southern Pine and 0.150 PCF for Douglas-fir, for all poles within 50 miles of coastal waters.

4.3.6 Retention of DCOI preservative shall be as follows:

4.3.6.1 Shall not be less than $2.4\text{kg}/\text{m}^3$ (0.15 pcf) as specified according to AWPA.

4.3.7 Penetration sampling of poles shall be as follows:

4.3.7.1 Category A - Poles with a circumference of less than 952 mm (37.5") at 1.8 m (6') from butt.

4.3.7.1.1 Bore twenty percent (20%) poles or twenty (20) poles, whichever is greater; accept if one hundred percent (100%) conform, otherwise bore all poles.

4.3.7.1.2 If more than 15% of the poles in the charge are found to be nonconforming, the entire charge shall be retreated. If 15% or less are found to be nonconforming, remove and retreat only those that are nonconforming.

4.3.8.2 Category B - Poles with circumference of 952 mm (37.5") or more at 1.8 m (6') from the butt.

4.3.8.2.1 13 m (45') and shorter; bore each pole in the charge. If more than 15% of these poles are found to be nonconforming, the entire charge shall be retreated. If 15% or less are found to be nonconforming, remove and retreat only those that are nonconforming.

4.3.8.2.2 15 m (50') and longer, bore each pole twice at an angle of 90° apart approximately in the same plane around the poles and accept only those poles conforming to the penetration requirement in both borings.

4.3.9.3 The depth of penetration shall be measured along a boring from the outer end toward the inner end for a distance throughout which there is continuous preservative penetration as indicated by evidence of preservative in each annual ring included.

4.4 RE-TREATMENT

4.4.1 **Poles treated with Pentachlorophenol or Copper Naphthenate or DCOI may be retreated once.**

4.4.1.1 Total steaming time, both for initial treatment and re-treatment, is cumulative and shall not exceed the limits for steam found in paragraph 8.a(2)(b) of RUS Bulletin 1728F-700. Re-treatment of cutback or reserve treated stock poles shall be by submersion in preservative for not less than 10 minutes under 25 pounds per square inch gauge pressure or not less than 30 minutes at atmospheric pressure.

4.4.2 Retreated poles shall conform fully to all the requirements of this specification.

4.4.3 Re-treated poles shall have a letter "R" die-stamped, hammer-stamped or burn branded in the sawed butt surface following the charge number to indicate that the poles have been re-treated.

4.5 SPECIES, LENGTH, CLASSES, PRESERVATIVE AND QUANTITIES

4.5.1 Refer to "Schedule of Material" or "Purchase Order". All sizes listed in Appendix

5. TEST AND INSPECTION

5.1 All poles supplied shall be inspected by an independent inspection agency. The cost for such inspections shall not be included in the quotation for poles. The inspection agency shall be selected by the Purchaser. The Purchaser shall contract directly with the agency for the inspection service.

5.2 The Manufacturer shall invite the Purchaser's Representatives (2) to witness tests/inspections. The invitation shall be extended at least two (2) weeks before the commencement of such tests/inspection. This condition may be waived at the discretion of the purchaser.

5.3 The Purchaser's Representatives shall at their own discretion perform supplementary or auxiliary inspection/tests. The Purchaser's Representative may reject any pole which does not meet this specification.

5.4 Inspection and tests shall be made according to best commercial practices as enumerated in applicable parts of standards referred to in Section 3. All relevant *Calibration Certificates* for Manufacturers' tests equipment shall be forwarded to the Purchaser at least ten (10) working days prior to the commencement inspection.

- 5.5 Refer to "Tests" Section 5 of "Technical Specifications, General Requirements" for further details.
- 5.6 All samples that are taken by the "Independent Inspection Agency" from Pentachlorophenol treated poles, shall be tested for retention at an independent lab as follows:
 - 5.6.1 For Pentachlorophenol treated poles, the test method shall be the Volhard Chloride (Lime Ignition) Test.
 - 5.6.2 For poles treated with Copper Naphthenate the test method shall be as specified in section 4.3.5 of this specification.
 - 5.6.3 For poles treated with DCOI the test method shall be as specified in section 4.3.6 of this specification.
- 5.7 All test reports shall be forwarded to the Purchaser within five (5) working days after completion of tests. All tests and inspections shall be executed in accordance with AWPA U1-20 and other applicable standards of the ANSI, RUS etc.

6. SHIPMENT

- 6.1 No shipment of poles shall commence without written authorization from the Purchaser or the Purchaser's Representatives.
- 6.2 As far as practical, poles shall be bundled and shipped according to lengths for safe and easier handling and preventing damage to poles.

7. ACCEPTANCE

- 7.1 Final inspection and acceptance of each pole will be made by the Purchaser at the destination. In case such inspection shows that the poles do not meet specifications or have been damaged in transit, the Purchaser will report to the Supplier by telephone or fax, who will instruct the procedure.
- 7.2 Neither inspection, waiving of inspection, nor the Purchaser's acceptance shall relieve the Supplier from obligations to furnish poles to meet the requirements of this specification.

APPENDIX

Wood Pole, Southern, Red or Jack Pine, Pentachlorophenol, Copper Naphthenate and DCOI treated, Heavy Retention, produced in accordance with ANSI 05.1 Specifications and Dimensions for Wood Poles and treated in accordance with REA 50-18 Specification No. DT-5C and AWWA Standard 1995.

Pole shall be bored, gained and cut to length prior to final treatment, and in accordance with the "Pole Drilling and Marking Guide".

Pole sizes are as follows: -

ITEM NO.	DESCRIPTION	STOCK NUMBER
1	9 m (30 feet) - ANSI Class 6	021701002002
2	10.5 m (35 feet) - ANSI Class 4	021701002007
3	10.5 m (35 feet) - ANSI Class 6	021701002003
4	12 m (40 feet) - ANSI Class 2	021701002005
5	12 m (40 feet) - ANSI Class 4	021701002004
6	14 m (45 feet) - ANSI Class 2	021701002001
7	14 m (45 feet) - ANSI Class 4	021701002006
8	18.5 m (60 feet) - ANSI Class 1	021701001003
9	18.5 m (60 feet) - ANSI Class 2	021701001007
10	20 m (65 feet) - ANSI Class 1	021701001004
11	20 m (65 feet) - ANSI Class 2	021701001005
12	22 m (70 feet) - ANSI Class 1	021701001006
13	22 m (70 feet) - ANSI Class 2	021701001008
14	22 m (75 feet) - ANSI Class 1	021701001001
15	24 m (80 feet) - ANSI Class 1	021701001002

Retention levels for all poles treated with Pentachlorophenol shall be a minimum of 7.21 kg/m³ (0.45 pcf), poles treated with Copper Naphthenate shall be a minimum of 1.28 kg/m³ (0.08) pcf and DCOI shall be a minimum of 0.15pcf(2.4kg/m³) as indicated by tests in Sections 4.3.4., 4.3.5 and 4.3.6 respectively. Should a conflict arise between this standard and any other relevant international standard, then the more stringent of the standards shall take precedence.

**TECHNICAL SPECIFICATIONS
TREATED WOOD POLES
JPSCO SPECIFICATION NO 4810-S-20**

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