

# Standard Specifications For Manufacturing & Treatment of Laminated Southern Pine & Douglas Fir Poles

## **I. SCOPE**

This specification covers the manufacturing requirements and treatment process of Southern Pine and Douglas fir glue laminated wood poles.

## **II. GENERAL**

Purchase orders or contracts will specify the length, class or groundline moment capacity, quantity, species of timber, and type of preservative.

When required, reference will be made to the drawing number that will give the details of drilling and will become a part of this specification.

Poles shall be in accordance with ANSI 05.2 –2002 including the following clarification revisions and all applicable AWPA specifications, including C28 for the preparation and treatment.

All referenced specifications and standards shall be of the latest revision.

The following general material and manufacturing requirements of sections III and IV shall apply to Southern Pine or west coast region Douglas fir poles regardless of the species.

## **III. GENERAL MATERIAL REQUIREMENTS**

This standard is to be used in conjunction with the AWPA standard C1 and M6. Structural glue laminated timber is an engineered product comprised of assemblies of specifically selected and prepared wood laminates bonded with adhesives. These assemblies are prepared under AITC standards 110-84, 111-79 and 200-92.

Lumber shall be west coast region Douglas fir or Southern Pine as defined in section 4.1 ANSI 05.2-2002.

All laminating lumber shall be graded in accordance with applicable grading rules of the West Coast Lumber Inspection Bureau (WCLIB 1993) for Douglas fir and the grading rules of the Southern Pine Inspection Bureau (SPIB 1994) for Southern Pine, as supplemented by the requirements of ANSI/AITC A190.1 and AITC 117-93.

All laminated poles shall have been glued with a wet use adhesive as specified in ANSI/AITC Standard A190.1

### **A. Flaws**

All lumber for laminated poles shall be free of timber breaks.

### **B. Soundness**

Decay in any form is not permitted, including decay in knots in any form.

### **C. Moisture Content**

Shall be per Section 4.3 of ANSI 05.2-2002.

## **IV. MANUFACTURING REQUIREMENTS**

### **A. General**

The supplier shall, to the best of his ability, eliminate all material that would be considered defective according to these specifications before requesting inspection by a designated representative. The designated representative shall not be required to act as the supplier's quality assurance.

### **B. Framing**

Drilling, if any, shall be as specified according to the drawings included with the order. Drilling on specified poles and square cut roofing on all poles shall be completed before the treatment process.

### **C. Humidity**

The relative humidity of the manufacturing area shall be maintained at such a level that the moisture content will not change substantially during the manufacturing process. All bonding shall be performed as soon as practical after checking moisture content.

### **D. Adhesives**

Adhesives for structural laminating shall conform to all applicable requirements of ANSI/AITC A190.1 to comply with wet conditions of use and be compatible with the selected preservative solution to be used. Adhesives containing urea shall not be used.

#### E. Manufacture

The selection, preparation, assembly, and bonding of the laminations shall be in accordance with ANSI/AITC A190.1 and as specified herein.

1. Edge Joints – Unglued edge joints shall be permitted for multiple width lamination lay-ups as permitted by ANSI/AITC A190.1. The non-cut edge joint gaps shall be limited to 1/4" and occasionally to a maximum of 3/8". The cut edge joint gap shall be limited to 3/8" for a nominal width of 10" and less, 1/2" for a nominal width of 10" to 12", 3/4" for a nominal width of 12" to 14", 7/8" for a nominal width of 14" to 16", and 1" for nominal widths over 16".
2. End Joints – End joints of laminations shall be pre-glued and cured before assembly of face joint into structural members. Spacing of the end joints shall be as specified in ANSI A190.1.
3. Repairs – Structural repairs as defined in ANSI/AITC A190.1 are allowed. End blocks as defined in ANSI A190.1 are prohibited.
4. Second Stage Gluing – When two or more laminated members that are over 2" in net thickness are glued together, a gap-filling adhesive shall be used in accordance with ANSI/AITC A190.1.

F. Proof-Loading – if performed, shall be in accordance with ANSI/AITC A190.1.

G. End Joint Spacing – when proof loading is performed in accordance with ANSI/AITC A190.1, end joint spacing is not required.

#### H. Dimensions and Tolerances

1. Sizes and tolerances for poles shall be in accordance with the following:
  - a. Depth +/- 1/2"
  - b. Width +/- 1/4"
  - c. Squareness +/- 3/8" per foot of depth
  - d. Length of poles under fifty feet, +6", -3", poles over fifty feet, +12", -6"
2. Unless specified otherwise on the plans, drawings, or purchase order, holes shall be a minimum of 1/16" and a maximum of 1/8" larger than the bolt diameter.
3. The tolerance on dimensions for hole location shall be +/- 1/8"
4. The camber or straightness tolerance for poles is +/- 1/2 inch for members up to 20 feet. For members over 20 feet, the tolerance is increased by +/- 1/2" per each additional 20', or fraction thereof, but should not exceed +/- 2". These tolerances are at the time of manufacture without allowance for dead load deflection and should be used for straight or slightly cambered members and not more sharply curved members.

#### I. Appearance

Laminated structural members shall be manufactured in accordance with the industrial appearance grade as defined in AITC 110 and as required in 1 through 6 as follows:

1. Pole corners shall be eased full length to a minimum of 3/4 inch and a maximum of 1 inch. The radius may be reduced to 1/2" inch for wireless telecommunication tower applications.
2. After gluing, all members shall be surfaced, at least on the two sides where glue lines are exposed.
3. Splintering around the holes caused by drilling shall be kept to a minimum. Holes shall be drilled perpendicular to the starting and finishing faces of members with a uniform cross section unless otherwise specified, or as specified on the plans and drawings of members with a variable cross section.
4. Occasional laminations may contain wane, may be scant of the specified width, or both. These conditions in a lamination shall not be more than 1/2" in width.
5. Medium splits in the outside laminations of vertical mounted members and short splits in the top laminations of horizontal and diagonally mounted members, developing at the laminating plant after gluing, are permitted.
6. All voids in the roof of poles shall be filled (after treating) with a void-filling compound unless otherwise specified. The compound shall be sanded or scraped smooth after patching. Wood dowels may be used to repair improperly drilled holes, as long as the defect does not affect the structural integrity of the member.

#### J. Pole Marking and Code Letters.

The following information shall be burned branded legibly and permanently on the face and the butt of each pole or included on a metal tag affixed thereto (see note below).

1. The supplier's code or trademark.

2. The plant location and the year of treatment.
3. Code letters denoting the pole's species and preservative used.
4. The size designation and/or equivalent class and the length of the pole.

Metal tags (non-corrosive) attached to the butt of a pole shall be securely affixed to serve the intended purpose.

The approximate treated weight of the pole shall be marked at the balance point of the pole.

Note: The supplier's code or trademark, the plant location, the year of treatment and code letters denoting the pole's species and preservative used (see above) may be omitted from the butt by agreement between supplier and purchaser. Information included in (4) may be then die-stamped or hammer-stamped. The code letters shall not be less than 1/2" high if burn branded and not less than 1/8" high if on a metal tag. The bottom of the brand or tag shall be placed squarely on the face of the pole and at 4' above the designated groundline.

**K. Testing and Inspection**

1. Requirements – Testing and inspection shall be in accordance with ANSI/AITC A190.1 and AITC 200.
2. Material – Testing and inspection shall be performed on the material and from the production that is supplied on the purchase order and produced in accordance with this standard. Samples for physical testing shall be taken at random.
3. Records – The results of all strength and wood failure tests of face, edge and end joints and test of void-filling compounds conducted on material produced in accordance with this standard shall be sent to the purchaser within five working days, if requested by the purchaser. Legible copies of hand written records shall suffice.

**L. Quality Control System**

The quality control system shall be as specified in ANSI/AITC A190.1. Daily records of the material produced under this standard shall be sent to the purchaser within five working days, if requested by the purchaser. Daily records shall include, at least the requirements established in the manufactures procedures manual and quality control manual and any others required in this standard.

**M. Incising and Radial Drilling**

Laminated poles constructed of Douglas-fir shall be incised prior to treatment. This incising shall be for the full pole length and on all four sides with a minimum depth of 5/8". The pattern shall minimize any damage to the surface of the pole by splintering and shall be a sufficiently dense pattern to assure uniform treatment.

All laminated poles constructed of or containing Douglas-fir shall be drilled or through bored prior to treatment. This drilling is in the zone extending 2' above and 3' below the standard groundline (as defined in ANSI 05.1), or as otherwise designated. For drilling, the boring shall be 3/16" diameter by 3" long and shall be spaced in a diamond pattern so that holes within a given diamond are approximately 6" apart. Drilled holes on the edge faces shall be omitted for the first 2 laminations on each side. Care shall be taken on the edge faces to ensure that drill holes do not penetrate along glue lines. All laminated poles constructed with Southern Pine shall be drilled with this pattern on the two constant pole faces only.

**N. Care**

For best results, all cuts and drilling should be done prior to treatment. Care should be taken to avoid mechanical damage in both handling and in service. When mechanical damage occurs, field treatment should be in accordance with AWPA Standard M4.

**O. Inspection**

Treated laminated poles shall be inspected after treatment in accordance with the applicable sections of AWPA Standard M2.

**V. TREATMENT**

All poles shall be treated in accordance with AWPA specification C1, C4, M2, and especially C28.

**A. Preservatives**

The preservative used in the treatment of the poles shall be one of the following: (This may be specified on the Purchase Order).

1. Pressure preservatively treated prior to gluing Southern Pine only- with chromated copper arsenate (CCA), retention and penetration shall meet the requirements of C28-soil contact.
2. Pressure preservatively treated after gluing Retention and penetration shall meet the requirements of C28-soil contact.

## **VI. COLOR**

Upon completion of the treating process, all poles shall be as light colored as reasonably possible to obtain a light to medium brown; color chart range three (3) to seven (7). Poles shall be clean and dry, without excess surface oil.

## **VII. INSPECTION**

### **A. Approval – If inspection is required**

Supplementing above-specified AWPA and ANSI standards, inspection of every pole for compliance with this specification may be made at the timber treating plants by a representative employed by the owner. The inspector shall be present for all tests even if performed by the supplier. Failure of the inspector to be present shall be a violation of the contract and cause for termination of the contract. Inspectors must stamp their mark on the top of the pole for the material approval (prior to treatment) and on the butt for approval of the treatment.

### **B. Penetration**

Penetration determination shall be made on 100% of the poles regardless of the specie. Penetration determination of the Southern Pine and the Douglas-fir shall be per AWPA C-28.

### **C. Reports**

If required, the inspector shall complete inspection and shipping reports of all poles shipped, listing all details of oil analysis, treatment procedures, penetration, retention, pole color, etc.

## **VIII. SHIPPING**

Shipments are to be made as specified on purchase order and all applicable Federal and State rules and regulations shall be followed. No pole shall be permitted to protrude above the top of the side stakes. Unloading of poles is the responsibility of the owner unless otherwise stated.

## **IX. ACCEPTANCE**

Final inspection and acceptance of each pole will be made by the owner at the destination. In case such inspection shows that materials do not meet the specifications or have been damaged in transit, then before accepting them from the transportation company and before unloading, the owner will report to the supplier by telephone or fax, who will instruct procedure. Vendor shall pay transportation costs both ways on all rejected poles.

Neither inspection, waiving of inspection, nor the owner's acceptance shall relieve the processor from obligations to furnish poles to meet the requirements of this specification.