# SPECIFICATION FOR BOULTONIZING OAK AND HARDWOOD CROSSTIES

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## A. SCOPE:

This specification describes the minimum requirements and the limitations in processing that must be adhered to when boultonizing either oak or hardwood crossties. The processor may use his own discretion on any phase of the operation providing it does not contradict any phase covered below.

## B. SEASONING PRIOR TO BOULTONIZING:

It is undesirable to boultonize crossties after seasoning has begun. Thus, every reasonable effort shall be made to tram and begin boultonizing within a month or two after the tie has been cut. Crossties which have previously been open-stacked, whether for air seasoning or for any other purpose, shall not be boultonized.

## C. MOISTURE REMOVAL DURING BOULTONIZING:

Prior to tramming crossties to be boultonized, the initial moisture content and the average density of the lot to be processed shall be determined. These values shall then be used in determining the amount of water to be removed during the boultonizing operation.

Using a calibrated increment borer, Section 5.95, AWPA Standard M-2, borings shall be taken from the approximate center of the side faces of 20 ties in the lot to be processed.

C. MOISTURE REMOVAL DURING BOULTONIZING (continued)

As each boring is taken, it shall be cut to a length of 2 inches and placed in a common tared weighing bottle, or other closed container, along with the other borings. The moisture content of the borings shall be determined by the oven drying method, ASTM Standard Method D 2016, Method A (attached).

The average green weight, green volume density of the wood in the borings shall be calculated using the formula:

$$D = \frac{(.121) \times (\text{grs initial wt.})}{(d^2)}$$

Where d = calibrated diameter of the increment borer (inches),

and D = the density of the borings (ties) on a green weight, green volume basis (lbs/cu. ft.)

Oak ties are to be boultonized until the moisture content of the ties is reduced to a level of 50 per cent or less. The water to be removed per cu. ft. of wood to be boultonized shall be calculated from the information determined above using the formula:

$$\text{Lbs. water/cu. ft.} = D\left(1 - \frac{1.50}{1+MC}\right)$$

Where D is the density of the green ties on a green weight, green volume basis (lbs/cu. ft.)

and MC = the moisture content of the borings expressed as a decimal.

C. MOISTURE REMOVAL DURING BOULTONIZING (continued)

Hardwood ties are to be boultonized until the moisture content of the ties is reduced to a level of 35 per cent or less. The water to be removed per cubic foot of wood to be boultonized shall be calculated from the information determined above using the formula:

$$\text{Lbs. water/cu.ft.} = D\left(1 - \frac{1.35}{1+MC}\right)$$

Where D and MC have the same connotation as for oak crossties.

D. TRAMMING FOR BOULTONIZING:

Crossties to be boultonized shall be trammed in much the same manner as they are when trammed for normal pressure treatment. The following exceptions shall be noted:

(1) Each layer of ties on a tram shall be separated from adjacent layers using at least two spacer strips at least 3/8 inches thick.

(2) The crossties shall not be loaded higher on the trams than the height to which the cylinder will be filled during the boultonizing operation.

E. BOULTONIZING PROCESS:

The total water to be removed during the boultonizing operation shall be determined by multiplying the pounds of water to be removed per cu.ft. as determined in Section "C" by the total cubic feet in the charge.

Other than making sure that the crossties are completely covered, considerable latitude is permitted in the actual boultonizing operation. The operator may or may not pull a vacuum as he deems desirable and temperatures up to 220°F may be used. The important guide-

E. BOULTONIZING PROCESS (continued)

line is the total amount of water removed during the boultonizing phase and during the vacuum phase drawn immediately following boultonizing.

A careful record of the water being removed during the operation shall be made. Measurements shall be taken at least hourly and these shall be totalled for comparison with the total calculated amount to be removed.

If it appears that the calculated amount of water to be removed is impossible to accomplish, then the boultonizing operation may be halted provided that during the previous hour:

(1) The temperature of the oil bath was not less than 205°F.

(2) A vacuum of 20" mercury or more existed in the cylinder.

(3) Not more than .2 pounds water/cubic foot of wood in the cylinder was recovered.

Following the boiling phase of the boultonizing operation, the cylinder shall be emptied of oil, and a vacuum of at least 30 minutes duration shall be drawn. Any water collected during such vacuum shall be considered as part of the total water required to be removed during the boultonizing phase.

Treatment

After boultonizing, the ties shall be pressure treated using an empty cell process. The retention of oil shall be the sum total amount of oil used during the pressure treatment process plus the oil used during the boultonizing operation.

May 4, 1978
Attachments