



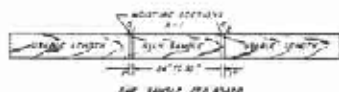
NEWS AND VIEWS OF THIS KILN DRYING BUSINESS

The Problem: How are kiln samples prepared for use in determining Moisture Content?

The Answer:

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Having selected specimens of boards, squares, bowling pins, shoe last blocks, or other items that are being kiln dried as being representative of the kiln charge, and particularly of the slowest drying material, the next job is to prepare the kiln samples. These are cut from the selected boards after the ends have been trimmed back to eliminate the effect of end drying. One-inch moisture sections are cut from the board adjacent to each end of the kiln sample. The kiln samples and the moisture sections should be numbered for future identification.



Method of cutting kiln sample and moisture content sections. Trim should be sufficient length to eliminate wood of low moisture content due to end drying.

The moisture sections are immediately weighed and then dried at a temperature of 212° to 220° F. until thoroughly dry and of constant weight. The moisture content at the time of cutting is then calculated. The average moisture content of the two sections cut adjacent to the kiln sample is assumed to be the moisture content of the kiln sample at the time of cutting. If the moisture sections are about equal in length, an accurate and a more convenient method of obtaining the average moisture content is to weigh the two together before and after oven-drying.

End Coat Sample to Prevent Drying

The kiln samples are immediately end coated to prevent end drying and are then weighed. The weight should be in grams or pounds and tenths of a pound. An effective end-coating material consists of filled hardened glass oil, spar varnish filled with aluminum powder, or some of the hot tar compounds. The weight of the kiln sample should be marked on it. This is the green weight. Knowing the moisture content of the board from the adjacent moisture sections, the oven-dry

weight of the kiln sample is calculated as follows:

$$\text{Calculated oven-dry weight} = \frac{\text{Green weight}}{100 + \text{moisture content (in \%)}} \times 100$$

The calculated oven-dry weight should also be marked on each kiln sample. This is an important step in kiln sample preparation and should be done quickly and accurately. The scales used for weighing the moisture sections and the kiln samples should be in good order and in good calibration.

Kiln samples cut from squares or specimen items like bowling pins or dimension stock, where sufficient material is not available to make moisture tests as recommended above, will have to be prepared with care and judgment. The main thing to remember is that the kiln sample determines the moisture content of the kiln charge and therefore a reasonably good and accurate moisture determination of the material from which the kiln samples are cut is necessary. Perhaps only one moisture section can be cut, but it is essential that a good test be made so otherwise the calculated oven-dry weight of the kiln sample will be in error and the operation of the kiln thereby faulty.

Determination of Moisture Content

Knowing the oven-dry weight of the kiln sample, its moisture content can be determined at any time by weighing it and making a calculation in accordance with the following familiar formula:

$$\text{Mois. cont. (in percent)} = \frac{\text{Pres. wt.} - \text{oven-dry wt.}}{\text{Oven-dry weight}} \times 100$$

This is the way it works. Let's assume that a kiln sample is made from a board. The average of the two moisture sections was 82.2 percent and the weight of the kiln sample at the time the moisture sections were cut was 4.46 pounds. The calculated oven-dry weight is then

$$\frac{4.46}{100 + 82.2} \times 100 = 2.75 \text{ pounds}$$

The value of 2.75 pounds is marked on the kiln sample. After some drying the kiln operator weighs it and finds that the new weight is 4.14 pounds and he would like to know what the moisture content is at this new and lower weight. The moisture content at this weight is

$$\frac{4.14 - 2.75}{2.75} \times 100 = 50.5 \text{ percent.}$$

Some kiln operators like to mark a weight on the kiln sample which corresponds to its calculated weight at a certain moisture content. For example, the kiln operator is interested in drying the kiln charge to a 6 percent moisture content so he calculates the weight of the kiln sample when it attains 6 percent. When the sample reaches this weight he then knows that the sample is at a moisture content of about 6 percent, depending upon the accuracy of the original moisture content determinations. A kiln sample, for example, having a calculated oven-dry weight of 2.75 pounds will

$$\text{weigh } \frac{2.75 (100 + 6.0)}{100} = 2.92 \text{ pounds}$$

and when the sample approaches this weight the kiln operator will know it is nearing 6 percent and the kiln charge is ready for additional checking before being conditioned and pulled.

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