

KILN DRYING WESTERN HEMLOCK
AND DOUGLAS FIR DIMENSION LUMBER

By Jack Dedman and Ernest Van Dusen

Description of Dry Kilns

We have eight Moore cross circulation dry kilns, two double track and six single track kilns 104 ft. long. The kilns have overhead fans with 6 sixty-inch fans in the single track kilns and seventy-two inch fans in the double track kilns. The fans are reversed automatically every four hours which saves labor and drying time. The walls are constructed of hollow tile and sand blasted with a cement roof.

There has been some discussion about the wicks in the drip cups on the roof of a kiln. We use two wool wicks in each drip cup, which we think gives an adequate oil supply to the fan bearings on the line shaft.

Another feature we are working on which we feel is particularly important is our door and end baffles. We have two single track kilns equipped now and hope to have the other kilns fully equipped in the near future. Because we are forced, in most cases, to stack three lengths to each crib, you can see we really need baffles. In checking air velocity, with a fan type anemometer, in our kilns that are baffled, we get approximately 250 fpm. In the kilns without baffles, approximately 200 fpm. It is our hope that in the future we will be stacking to length and in so doing, increase the efficiency of air circulation in the kilns.

Kiln Schedules

I am going to talk to you today about some 'fun' we have had drying hemlock dimension lumber at Willamette National Lumber Company.

We were notified by top management in early 1964 that we would be producing 1-1/2 inch kiln dried hemlock dimension as soon as we could get our inventory practically aligned. We started on this realizing that an average of 15% moisture content was our goal with a maximum of 19% moisture content and not over 5% of the kiln charge over 19% moisture content. Of course this would be easy to do if you didn't have to dry hemlock dimension.

We used the oven dry method to check initial and final moisture content and in addition checked final moisture content with a resistance type moisture meter. It was interesting to compare the moisture content of the kiln samples with the metered moisture content.

We also used the hot meter check, that is actually going in the kiln and metering with a long needle head, usually 3/4 to 1" needles. The moisture meter readings from this hot test were corrected for temperature. In most cases, we made our hot meter check at 84 to 90 hours. This usually gave us a fair indication as to the approximate time to pull the kiln.

We like to condition our dimension lumber at conditions for equilibrium moisture content of 11 to 16% from 4 to 8 hours, depending on the average moisture content after checking the kiln charge. We believe in this conditioning especially if you have kiln time and space, primarily for ease of manufacturing and a softer shell for consumer useability. Also, with our particular kilns and timber, we find that the moisture content will drop another 2 to 3% in 6 hours.

I might mention at this time that we are very appreciative of the courtesy and help in the fore-mentioned checking procedures extended us by the Weyerhaeuser Technical Center at Longview. They were very kind.

The hot lumber testing method is especially interesting when you use the oven dry sample method also, and then compare results. Although the oven dry method is more reliable, the moisture meter system is simpler and quicker.

To keep ourselves and the moisture meters accurate, we still use the oven dry method on our schedules periodically through the year, especially at the start of each season. When I talk about Northwest seasons, you all know what I mean, damp to damper and wet to wetter!

We have some slides that I would like to show you at this time. They are graphs on some of the schedules we tried and were instrumental in arriving at the schedule we now use at our plant. (Figures 1 through 8 show moisture content distribution and kiln schedules for western hemlock dimension. Figures 9 through 11 illustrate kiln schedules and moisture content for Douglas fir dimension.)

You will remember at the start of our little talk, I used the word 'fun' which means mirthful, sport or diversion. I choose to use the 'diversion' portion of the definition. We diverted from our ordinary routine of drying and found it to be both interesting and especially fun.

Perhaps I sound more enthusiastic than I should, but I happen to be one of those odd balls that worked in a sawmill for 25 years before I found out that a kiln was used for something other than just an instrument to keep the rest of the plant out of steam.

After the new wears off a job, it is natural for all of us to succumb to routine, and then our work becomes drudgery. We feel this can be overcome or at least helped if we apply different ideas occasionally, and do some experimenting on our own. We have so many sources to turn to, such as our many fine forest products laboratories and dry kiln clubs, who are most cooperative. So let's all put a little 'fun' in drying, you will be surprised with the results and certainly won't regret the experience.

Thank you for your kind attention.

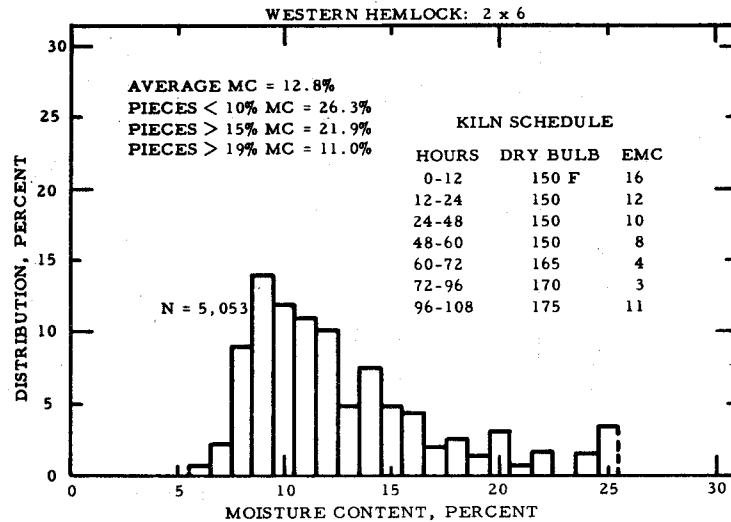


FIGURE 1.

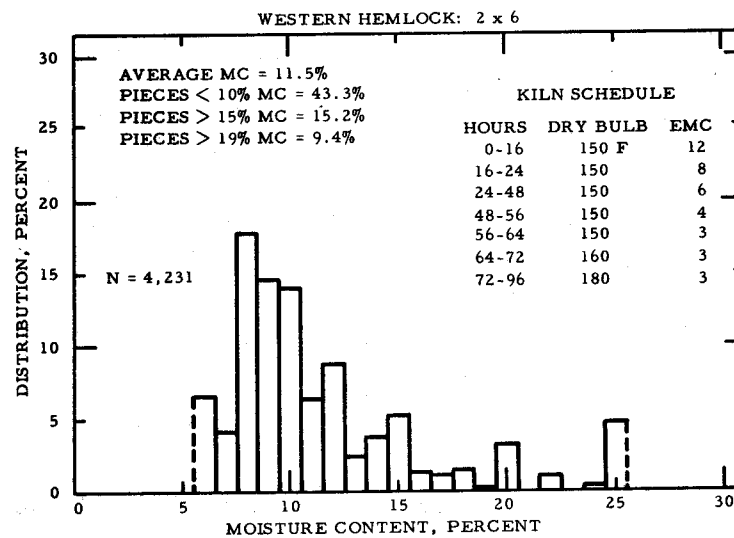


FIGURE 2.

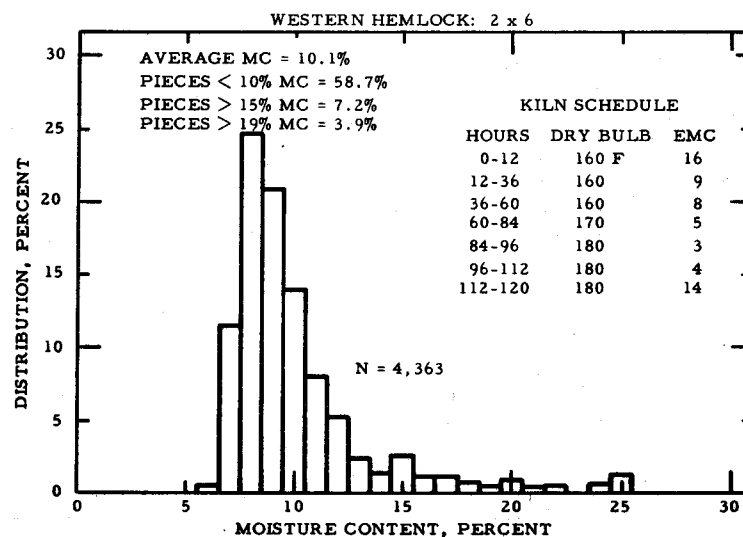


FIGURE 3.

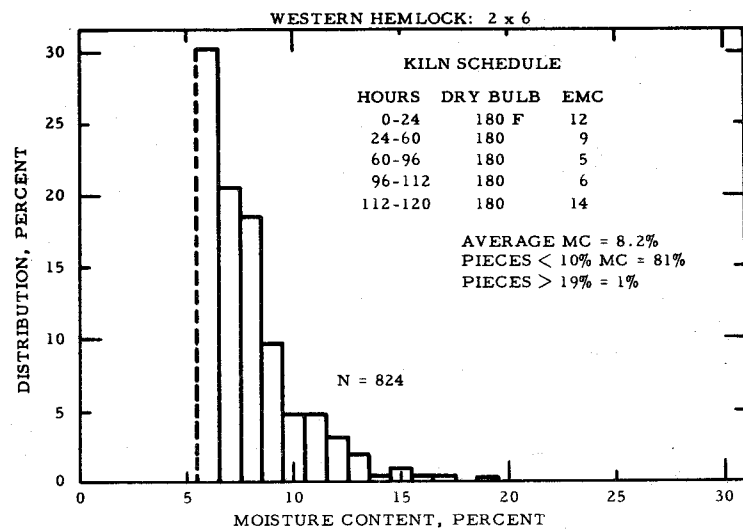


FIGURE 4.

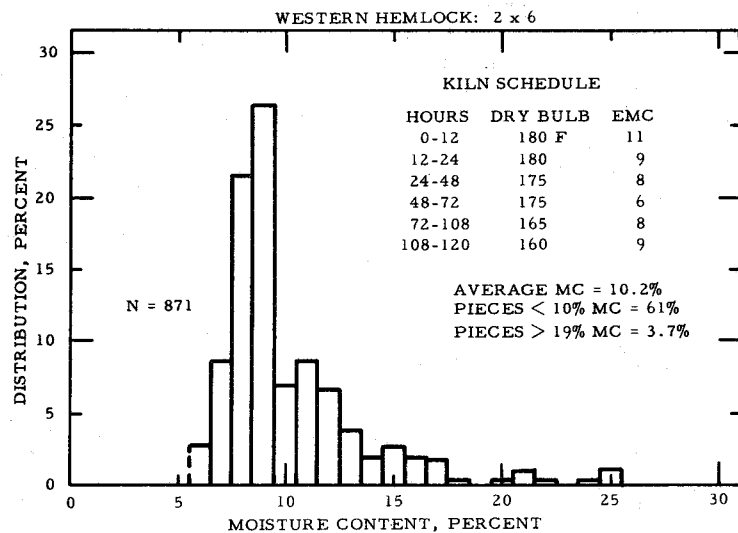


FIGURE 5.

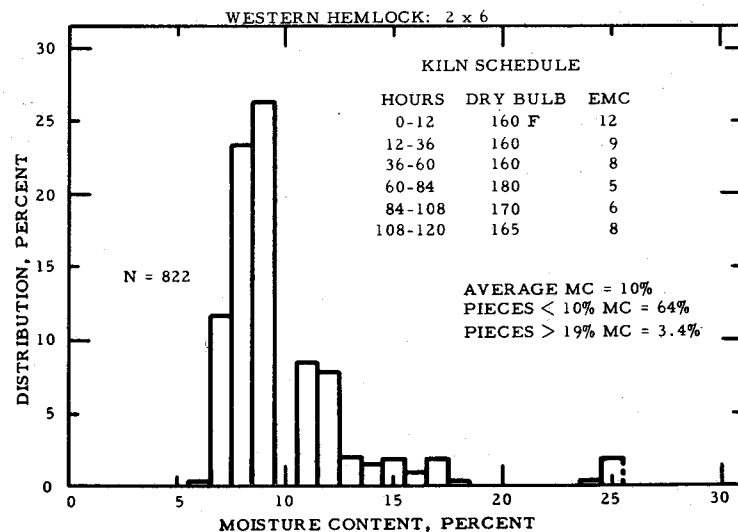


FIGURE 6.

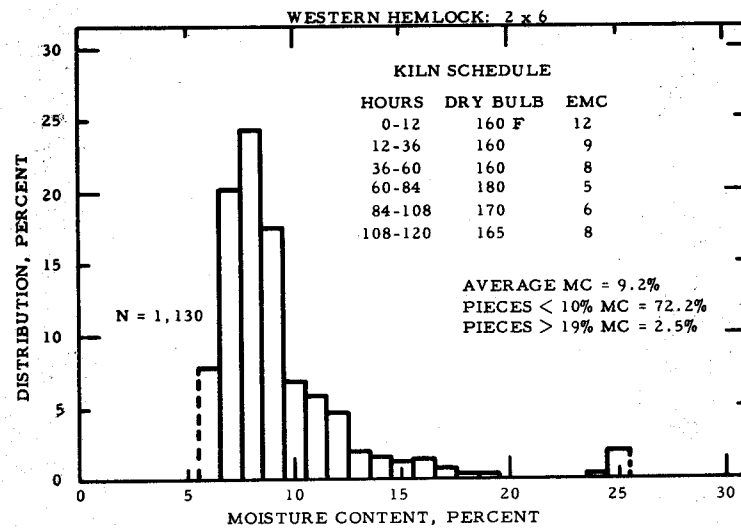


FIGURE 7.

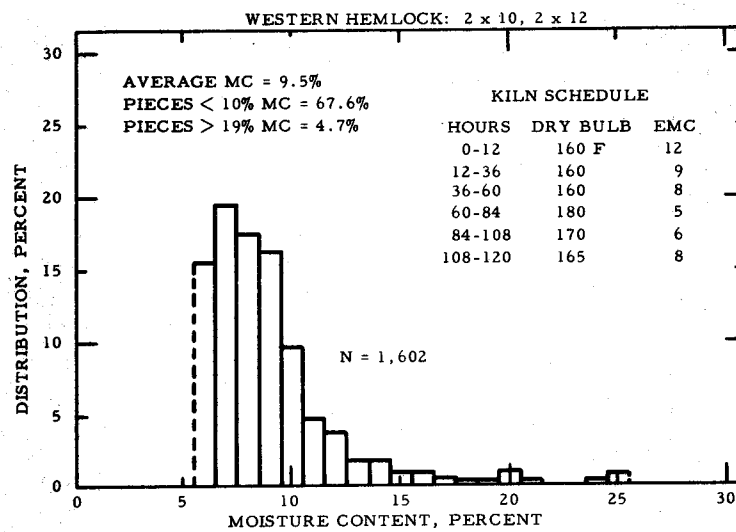


FIGURE 8.

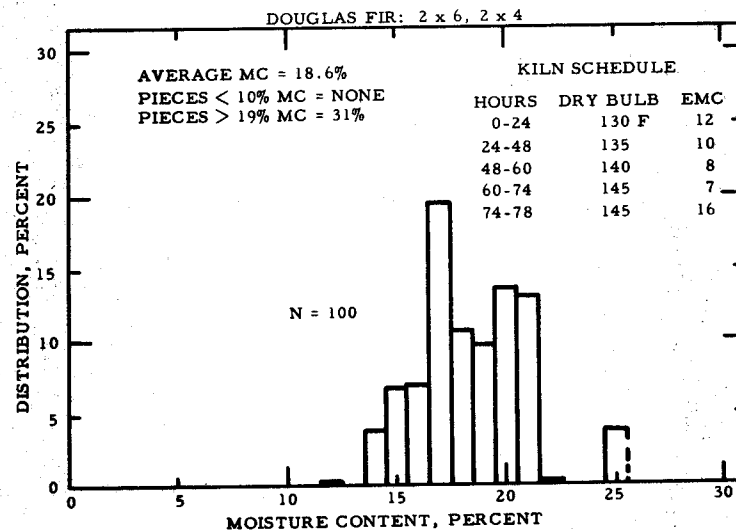


FIGURE 9.

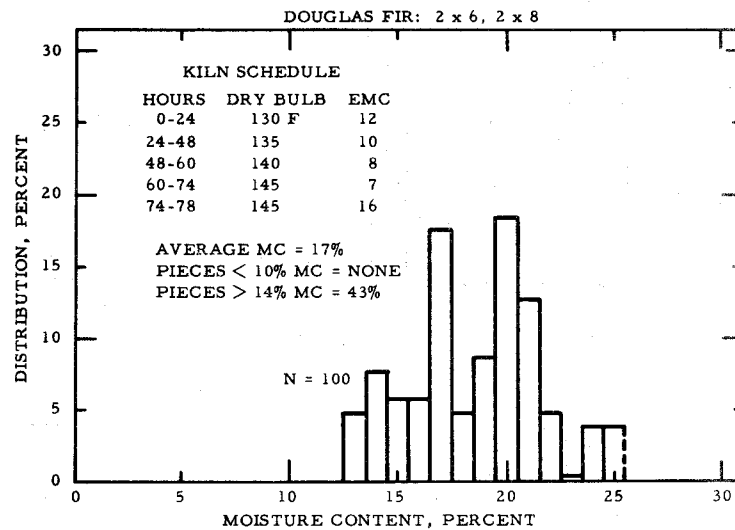


FIGURE 11.

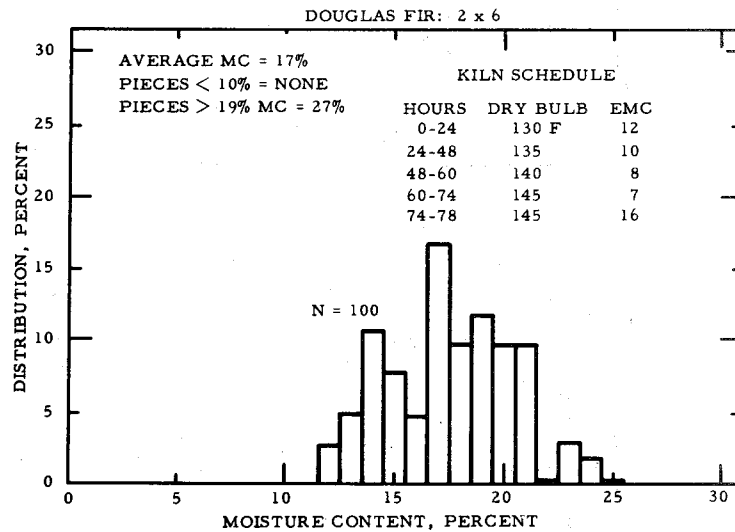


FIGURE 10.