

A METHOD FOR DRYING QUALITY DIMENSION HEMLOCK

Ed Woods
Drying Consultant
Hammond, OR

Some basic variables in lumber coming to the kilns are:

1. LOGS
 - a. size and age of logs
 - b. time from the stump to the mill
 - c. method of log storage
 - d. area where timber was grown

2. MANUFACTURING
 - a. sawing and trim accuracy
 - b. off-species sort
 - c. length sort and sticking accuracy
 - d. air drying time

3. DRY KILNS
 - a. heat source
 - b. air flow speed
 - c. controls
 - d. vent size and placement
 - e. basic kiln and door seals
 - f. temperature and relative humidity of ambient air

The "Ideal Kiln Charge" would consist of logs of the same species, age, time of harvest, and stored the same way. The lumber would be sawed and trimmed accurately, stick evenly one length to the load, and air-dried the same length of time.

The kilns would have an abundant heat source, the air flow would be balanced, the control would maintain set-point, the baffles would direct the air through the sticker lines, and the ambient air would be warm and dry (so much for dreams!).

Since none of us have seen many "Ideal" kiln charges, we strive to balance the many variables of each kiln charge. To remain competitive we are usually pressed for time, and there is **no** substitute for time in quality drying. Each of the variables the kiln operator can recognize and nail down, makes the drying job more on target and repeatable. The kiln operator needs to know the lumber coming to the kilns, keep the kilns equipment in good repair, and adjust as much as possible to the time limits.

Attention to details is vital. Time and effort spend during manufacturing, sticking, and loading will pay off in improved results. Western hemlock lumber is fairly forgiving to dry, but as with all things, there are limits.

A method I have found effective in developing a basic schedule is as follows. Choose a target dry bulb temperature, and ramp up to set point as quickly as possible while holding the wet bulb temperature at about 10 degree depression. When set points

are reached, hold the kiln at those settings for approximately 8 hours to heat the lumber to the core. During this step, over one-third of the water weight, as free water, is lost. The kilns should have adequate floor drains for the water to drain away so it doesn't have to be vaporized and driven out the vents.

The next step is to start ramping the wet bulb temperature down by holding the dry bulb temperature and lowering the wet bulb set point. The rate of ramping depends on the kiln's ability to hold dry bulb set point. If the kiln can't hold dry bulb temperature, the kiln is out of control. Wet bulb depressions of 25 to 45 degrees can be reached and held. The degrees of depression depends on the dry bulb temperature, fan speeds, and heat supply. I tend to start out on the conservative side and work my way up. This step of high depression can be held for 16 to 25 hours and should bring the charge down well under fiber saturation pint. Due to the moisture gradient found in hemlock, about two thirds of the pieces should be close to dry at the end of this step.

At this point, an equalizing step is started by ramping the wet bulb temperature up, thus lowering the depression by 10 to 20 degrees. This step should be held for 8 to 12 hours to attain a close moisture gradient throughout the kiln charge. At the end of the equalizing step, shut the kiln down and do an extensive moisture check. This schedule will need to be adjusted due to changes in the lumber and weather.