

DRYING IN THE INFORMATION AGE

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The basic geometry of a dry kiln has changed little over the last 70 years. We usually think of a dry kiln as a rectangular structure which has a source of heat to heat air that is circulated throughout the kiln by fans. In the last few years we have seen a number of changes in the technology used to control the various functions of the kiln. On/off pneumatic valves are being replaced by modulating proportional valves, vents are being replaced with vent exchangers and manual controllers are being replaced by computerized kiln controllers.

In recent years, we have seen a major philosophy change in the drying of lumber. I am referring to the philosophy of drying to a higher moisture content in order to reduce the amount of degrade caused from over drying. Many companies are working on drying schedules that provide the greatest kiln production while minimizing degrade. In order to do this it is essential to be able to see what effect any changes made to the drying schedules have on the quality of lumber and the efficiency of the kiln. Today's computerized kiln controllers provide vast amounts of information on about the various functions of the kilns relative to the drying schedule selected, but, they can not provide information about the resulting effects of the schedule changes. In order to do this one must know the moisture content of each board in the kiln charge, as well as the actual grade recovery. It is also necessary to have this same information about your drying process before you make any changes to your drying schedules. Otherwise, you have nothing with which to compare your data. How do we do this? There are several systems available to record the results of grade recovery.

How do you determine the actual moisture of the lumber in the kiln or after it has been pulled from the kiln? You are all familiar with the resistance type pin type meters, either the portable or permanently mounted in-kiln version. Accuracy of either of these meters suffer from the limited sample base used for calculating the moisture content.

The most practical means of developing this information is the use of the Wagner in-line moisture detector that checks each board individually for moisture content. Earlier moisture detectors were capable of marking wet boards, but, they had no capability to record this information. As technology advanced so did the capability of the moisture detectors to provide information for analysis. The models of the 1980's could mark wet boards and print reports on the moisture content from 5 percent to 26 percent in 2 percent increments.

In mid 1991, Wagner introduced their model 683 in-line moisture meter with the Info-Pak information package. In addition to identifying wet boards, the Info-Pak information system records the average and peak moisture content of every board that crosses the sensor. This data is stored in the computer for convenient retrieval to generate a variety of graphs and reports that are invaluable in the identification of kiln problems.

The model 683 is available with two different sensor configurations. The 1416 end-to-end sensor scans the board as it travels length wise through a u-shaped sensor. The sensor is mounted between the planer and the out-feed conveyor. This

arrangement is well suited for lamination plants and mills that do not have room to install a wet board drop-out before the planer.

The second configuration employs several 1777 sideways sensors placed between the planer in-feed chains after the break-down hoist and the planer in-feed. This application is especially useful in conjunction with the wet board drop-out.

There are a number of options available for the model 683. The basic unit with either type sensor configuration will mark wet boards for peak moisture content. The 683 with the 1777 sideways sensors can use the tipple relay output that drops wet boards out of the system before they get to the planer.

Other features include a peak/average option that enables the system to mark or drop out wet boards based on the average moisture content of the board rather than the peak moisture content. Depending on the species of lumber you are running or the requirements of your customer, this can be a very valuable option.

The moisture marking levels are selected by the user to best meet their needs. They can chose up to four wet markers or three wet markers and one dry marker.

The export spreadsheet feature allows the user to export the board data saved by the system into a spreadsheet where the user can format reports and graphs to meet their individual needs.

The Info-Pak hardware package consists of a remote input terminal, computer, and printer for imputing, storing, and printing reports and graphs. The remote terminal is located near the break down hoist or other convenient location. An operator near the break down hoist enters the kiln number, pull date, kiln number and kiln car number.

The following reports can be produced by the Info-Pak software package:

- Shift report
- Car report
- Kiln report
- Kiln side-view report
- Kiln end-view report
- Live board report (not stored for later use)

The following graphs can be produced for most of the above reports:

- Average moisture histogram
- Peak moisture histogram
- Average moisture distribution graph
- Peak moisture distribution graph

The Info-Pak information system has the capability of storing information and generating reports that are invaluable for analyzing the performance of your kiln schedules. With this information you can make adjustments to your kiln schedules to obtain the maximum efficiency from your kilns while maintaining maximum grade recovery.

Kiln view reports can show you where you have uneven heat distribution within your kiln. This information enables you to isolate the problem and correct it to get better performance.

With the export spreadsheet feature you can take the information from each board and reconstruct its position in the kiln and actually create a moisture content graph of the kiln. Producing a graph of this type can be time consuming, but it can provide valuable information about your kiln.

The decreasing supply of logs and the increasing prices of processed lumber make it essential that you use all the information that is available to you in making sound decisions about your drying operation.

The basic geometry of dry kilns may not have changed much over the last 70 years but the philosophy of how we use them is forever changing. By the way, the in-line moisture detector will also prevent you from having costly wet claims!