

LUMBER DRYING TACTICS FOR THE THIRD MILLENNIUM

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Kiln drying lumber is a constant hassle. Rather than that, it is a series of hassles facing kiln operators every day. This paper discusses four of those complaints that you face and gives you four stealth lumber drying tactics that will help you overcome those hassles.

FOUR LUMBER DRYING HASSLES

Hassle #1: Most kiln operators are constantly faced with NOT knowing for sure whether each charge is being dried to the optimal moisture content.

The dry end is the last department to receive any capital funds for knowledge improvement. Computerized log scanning and bucking, head rig optimizers, edger optimizers, trimmer optimizers provide diagnostic and analytical reports on a by-shift, even by-log basis. Few of you know, with any precision, the total amount of water needed removed or the distribution of input MC for each charge.

Modern kiln controls give pretty good drying process control. In-line moisture meters give adequate after-the-fact or as-dried distributions. Most of us, however, don't know where we are starting. The rule, then, is to overdry and prevent developing wet stock and extra handling charges.

Hassle #2: Most kiln operators do NOT know when a charge is dried to the optimal moisture content and ready to leave the kiln.

If you didn't know where you were when you started and are using a time based schedule, you are banking on hitting an average. That is a good way to dry lumber badly. In-kiln monitors are an improvement, but if you have a wide range of input "dryability" requirements, you running a risky operation.

Hassle #3: Most kiln operators have too much lumber for too little kiln capacity.

For those mills with logs and running full shift operations, all of the sawmill improvements in the 1980's have boosted volume recovery and production rates. Markets have been changing, demanding less green lumber (Europe, for example or the DIY retail demand). Capital investment in boilers and dry kilns have not kept up with the green end improvements.

Hassle #4: Nothing seems to be available to increase quality or gain control of the kiln drying operation.

Dry kiln operators are frequently looked on with all of the affection of a range bull eyeballing a bastard calf. They are often treated like the red-haired step child. For sure, kiln controls have improved, like "Zone Controls". They require investment and may not be suitable for all retrofit situations.

These four hassles lead to a "Rodney Dangerfield (I don't get no respect) mindset." Ah, the kiln operator, that lonesome soul, who works in the middle of the

night, on weekends, who nobody appreciates. He is sure that he was out sick the day they chose who would be kiln operator.

FOUR STEALTH LUMBER DRYING TACTICS

If it does get darkest just before dawn, then adopting the four stealth lumber drying tactics can be the sunrise on a new kiln drying era.

Tactic #1: Implement a simple, value-based, easy-to-use, consistent program of finished goods moisture content measurement.

Use the following "Basic Rule of Lumber Overdrying": For every 1% MC lumber is dried below the target MC, at least 1% of the lumber value is lost! As an example:

ACTUAL 1992 CASE STUDY: EASTERN OREGON DRYING DATA

| | ----- % Moisture ----- | | |
|--------------------|------------------------|---------------|-------------------|
| | <u>Target</u> | <u>Actual</u> | <u>Difference</u> |
| PP 2 x 6 Unsorted | 17.0 | 14.0 | 3.0 |
| PP 1 x 12 Sap | 13.5 | 10.2 | 3.3 |
| PP 1 x 10 Ht & Sap | 13.5 | 7.6 | 5.9 |
| PP 1 x 12 Heart | 13.5 | 11.5 | 2.0 |
| | AVERAGE = 3.6% | | |

VALUE LOSS CALCULATION

- SALES VALUE: \$350
- OVERDRYING RATE: 3.6%
- VALUE LOSS PER BOARD FOOT: \$12.60
- ANNUAL VOLUME: 75 MMBF
- ANNUAL DOLLAR LOSS: \$945,000

Tactic #2: Develop a method for determining the exact pull time for each and every charge.

VALUE LOSS FORMULA FOR RUNNING A KILN CHARGE PAST OPTIMUM PULL TIME:

$$\text{MBF/CHARGE} \quad 4\% \text{ MC/HOUR} \quad \$3/\% \text{ MC/MBF} = \$/\text{HOUR}$$

Source: Dr. Gene Wengert, Brooks F.P. Center, Blacksburg, VA

KILN DRYING PAST OPTIMUM VALUE LOSS CALCULATION

KILN VOLUME: 100,000
DRYING RATE: 4% / MC / HOUR
VALUE / MC FACTOR: \$3.00
LOSS PER HOUR: \$1,200
LOSS PER MINUTE: \$20

Tactic #3: Maximize the flow of "On Temperature" air for the specie and drying cycle stage.

Find out where you are now. An excellent checklist is available. Contact the Forest Products Laboratory, One Gifford Pinchot Drive, Madison, WI for a free copy of General Technical Report, FPL-IMP-GTR-1, titled "Quality Drying of Softwood Lumber." (You can call Mike Thornson, 608-231-9355, Processing System Optimization Department for a copy).

The venting process, interruption of the drying cycle to allow outflow of moisture laden air and the inflow of cooler, dryer air, has been improved. Baffle maintenance, kiln sticker placement, fan design, fan motor horsepower, variable speed air flow are all topics that can be maximized for each specie and drying cycle stage.

Tactic #4: Dry homogeneous groups of lumber.

This tactic has a tremendous amount of stealth power for the kiln operator. Each slice of a tree has a different dryability factor. This factor varies from top to bottom, from tree to tree, by specie and over time. There are two important parts to this factor: the speed or rate at which water can be removed WITHOUT causing degrade and the length of time this takes.

Some species have heart/sap groups that can be visually detected. Others split up fairly well using weight per cubic volume as the discriminator. Technology now exists to determine accurately the sample moisture content of the board. A combination of weight per cubic volume and sample MC is a very effective predictor of dryability.

Use the Pareto Rule of 80/20. Identify the 80% of the population that can be comfortably sorted, separate it and precisely dry it. Flag the other 20% as problem stock and air dry it or take those measures that minimize degrade and maximize value recovery.

Use the stealth tactics and watch the hassles disappear. Do they really? Listen to published reports of operators who have used these tactics:

"We're in a large quantity of "bug" timber and the green moisture content is ranging from 30% to 90%. If it wasn't for the implementation of this system, we would be in one bad fix." (Estimated annual savings = \$825,000)

"Our gain is increasing by the month. The whole program is a plus for us". (Estimated annual gain = \$630,000).

"Our drying program has skyrocketed. We are drying with a lot less time and a lot more quality". (Estimated gain = \$225,858)

How much will your gain be as you adopt the stealth lumber drying tactics for the third millennium?