BENEFITS ACHIEVED FROM USING IN KILN MOISTURE SENSING SYSTEM

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Description of System

1) The in kiln system consists of two (2) stainless steel strips 9 feet long across double wide lumber package measuring about 40 inches of lumber.

2) In three (3) double track by 88 foot long dry kilns, in kiln moisture sensing measure (4) zones per track.

3) The in kiln moisture measuring system monitors lumber average moisture content between stainless steel strips as the lumber dries. The moisture content at the eight (8) measuring zones per double track dry kiln are averaged on a continuous basis via the PLC process control system through the conditioning or equalizing cycle and turns the kiln off automatically at the predetermined moisture content target...moisture content average within 1 percent of the target moisture content.

Overall Benefits Achieved Were

1) Drying production initially 115 million b.f. and kiln constrained. After in kiln moisture sensing system installed, production increased to 120 million b.f. We are currently at 135 million b.f. annually.

2) Elimination of hot checks saved 2 plus hours of labor, saved energy, and helps kiln maintain accurate dry bulb and wet bulb targets. We reduced case hardening, enhanced quality, and got better grade recovery (less breakage, flatter lumber more consistent quality), reduced drying time (if lumber is partially air dried or dealing with older logs moisture sensing will reduce drying time by causing the kiln to go through steps to equalization sooner and end at target moisture instead of time).

We experienced trim loss reduction of 2 percent and increased grade recovery of 2.5 percent.

3) Shutting kiln down at final desired moisture content target. This is achieved by doing moisture checks on charges at planer once we get to the best target moisture content. We follow up moisture checks twice a day at the planer and consult with graders on overall quality to see if we need to make any adjustments to target moisture content or schedule.

There was a study several years ago done at a dimension mill in Western Oregon on how much money was lost by over drying the lumber. These results may not apply in your case, but they were very interesting. Using 17 percent moisture content as your optimum number, at every percentile below 17 percent this mill lost $3.00 per thousand down to 13 percent. Each moisture content percentile below 13 percent the mill lost $6.00 per thousand. (DCH).

In my opinion the in kiln moisture sensing system is one of them most valuable tools you can purchase to help achieve a successful lumber drying program.

In our case we interfaced it with a kiln controller. This greatly enhanced the entire system and enabled us to design our drying schedules according to moisture draw during the drying process, this helped us achieve shorter drying times and we were able to program our kiln to drop into equalization and conditioning on target moisture content. When the kiln shuts down at target moisture it opens vents and sends a radio signal to our kiln operator and tells him the charge is done.

We experimented with traditional drying first then we experimented with CRT (continuos rising temperature) drying which worked exceptionally well with our lumber consisting of 80 percent plus heart center. We were able to keep lumber flat and reduce breakage through our machine centers at high speed thus allowing us to get maximum recoveries with best quality appearance and grade.

Results Before and After Moisture Sensing System

Three double tack by 88-foot long dry kilns confirmed lumber drying times as follows:

	Prior to Moisture Sensing Installation	After Moisture Sensing Installation
Douglas fir and larch 2-in dimension	27 hours	20 hours
Lodgepole pine 2-in dimension	40 hours	31 hours
Hemfir 2-in dimension	60 hours	45 hours
Standard deviation	6.5-7%	3.5-4%