SOLVING PROBLEMS WHEN DRYING WHITE FIR

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I am here to talk about how we dry WF at Shearer Lumber Products, a division of Bennett Lumber. We have two plant sites. The sawmill and dry kilns are located in Elk City, Idaho and our Planer and Shipping facility is in Grangeville Idaho 50 miles away. We produce:

- White Fir
- Red Fir
- Ponderosa Pine
- Lodge Pole Pine
- Alpine Fir
- Spruce
- Inland Western Red Cedar

Communication

Our number one priority is communication. One of the first steps I took to improve communication was to mark every unit before it leaves Elk City. To emphasize how important communication is, I would like to relate a little story:

One day our planer supervisor called and said the lumber was all to heavy. I said the lumber is all marked. What seems to be the problem? The planer supervisor said the units marked DRY are dropping out a lot of wets. I said that's the reason I mark all units. D.R.Y. means "Don't Run Yet. You need too run the units that are marked G. That means "Go ahead & Run Now". It wasn't long and I was getting loads back marked WET. I checked some of these loads and some were a little heavy but most were ok. I called the planer supervisor. I said these loads are not wet. He says W.E.T. stands for "Wrong Every Time."

Seriously to have quality drying you need to have good communication from the boiler to the planer. We contact the boiler any time there is a change that could up set the flow of steam. We talk with the planer many times in one day about moisture content, lumber shipments, what's coming out of kilns, etc., probably four times a day when things go smoothly. If there are problems it could be 24 times. We have to make communication #1 because of our 50-mile space between the kilns and the planer. We probably have better communication than most kilns with their planer a rock throw away.

Weight Sort

We use Weightec weigh scales before the bin sorter (Figure 1). We sort by three weights in the sawmill heart, sap, and super sap. These scales do a good job of sorting by weight as you can see on the slide. The trouble with white fir is that the weight and moisture content do not run hand in hand on all boards. For example a 2x12 white fir 16' dimension board can weigh 120 lbs. and be 35 % mc and a board of the same size can
FIGURE 1. Weight sorting system.

weigh 70 lbs. and be 120% mc. There are some systems in the industry now that are pretty accurate at measuring moisture content in green lumber. If anyone were putting in a new system I would recommend measuring moisture content instead of weight.

Stacker

After the lumber is run thru the sorter, we stack two lengths per load. I think single length loads are best but with three weight sorts our sorter will not allow it. You should never go over two length loads. We also have box piler at the infeed to the stacker. We use 7/8"-thick by 1 1/2"-wide red fir stickers spaced every 2'. We also use 3x3's ad & stickers every 2 ft. These are shown in Figure 2.

Weights

When we load our lumber in the kilns we use lumber restraints on top of the lumber. We have 2 different styles of weights. One is 1/2" steel plate with a 16' length weighing approximately 2000 lbs. The other is 4"-thick concrete weight with a 16' length weighing approximately 6000 lbs. We also have our carts built to tip towards the center. This makes a natural chimney and keeps the weight towards center. Figure 3 shows the concrete top restraint and the effect of angled kiln carts. Figure 2 shows the steel weights. I highly recommend weights but you need to make sure you have a good foundation, as you can see in the picture. We have had some good wrecks to find our weak spots. We have supports every 2' on our carts. Here is an example of the economics of using weights. We ran 66,000,000 board feet of lumber last year. Approximately 1,150,000 bf of this was in the top course. If we held that top course one grade from #3 to #2&btr, we made $149,000.
Kilns

One thing a person wants to remember is that you don't have to have all new kilns to dry good quality lumber. Our kilns are not brand new or even all the same.

Moisture Meters

There are lots of meters out there, but Wagner meters seem to work best for us. A Wagner 683 I.C.E. at the planer and a Wagner 610 at the grading table. At the kilns we use the 612 with 712 probe. We do 24 checks per bottom unit, three boards in each of eight courses (Figure 4). For a single track kiln that is six cars long, we do 144 checks per side for a total of 288 readings. We take readings in multiples of 6 because the meter printout is set up in rows of 6. This makes it easier for identifying individual units. We do cool checks in the same way.

Schedules, Temperatures, and times

We use white fir schedules that don't go over 190°F and start with a wet-bulb of 185°F. We then drop the wet-bulb temperature through schedule, ending with a setting of 190°F for the dry-bulb and 160°F for the wet-bulb. Our pull points very with different times of the year. This time of year we will target our white fir to be at 15% moisture content with 25% of the samples over 18% moisture content on the Wagner printout (Figure 5). This is just a target & you can see the percentage over 18% moisture content is 18.7%. We do a cool check after 12 to 24 hours. As you can see it will drop a few points. When cool this will give us a final moisture content of approx 12% at planer with
FIGURE 3. End view of kiln charge showing effect of angles kiln carts and concrete weights.

FIGURE 4. Locations at which the stack probe is used to measure the moisture content of three boards.
FIGURE 5. Moisture content distribution.

8% wet drop out. We have two Wagner 612 meters at the kilns and rotate their usage weekly. A printout is made for every charge for both hot and cool checks for our records. These are an important reference.

Marking Units

We mark all units with a number that represents its place in the kiln. Example 4-4-201 in Figure 6. The first number represents the kiln, the second represents the charge, and the third is the unit number. This way a unit can be identified as to what kiln it came from, when it was dried, and where it was located in that kiln. The lumber is then shipped to Grangeville for planing. When it arrives, our Q.C. supervisor starts doing checks on random units. He then sends this info back to me in Elk City.

Lumber at Planer

As the lumber is run at the planer it runs over the break down hoist, then it goes over the moisture meter pads. We have a wet board drop out before the planer which is set at 19%. This allows us to restack and redry wet lumber. In warmer months, we air dry wets. In the cooler months we send the lumber back to Elk City to for redry. At the planer office we have the 683 computer which gives us updated readings any time they are needed. At the end of each day these are sent to Elk City.

Our wide white fir lumber lays flat with no roller split. This is do to using weights and the way our lumber units are prepared for drying.
Summary

In summary the following procedures have helped us with white fir drying at Shearer Lumber Products:

- Good communication from boiler to planer
- Weight sorting into heart, sap, and super sap
- No more than two lengths per load
- Box piler at stacker
- Lumber restraints—metal or cement
- 3" by 3" bunks and stickers every 2'
- Carts with supports on 2' centers
- Carts tipping to center
- No deviation from a set procedure for checking the moisture content of lumber
- Keeping good records
- A system to identify units after they are out of the kilns and at the planer.

Other things to remember: you don’t need the latest technology in dry kilns to dry good lumber, the straighter you dry your lumber the more the more money you can make, and moisture meters are just a tool. I heard a saying once "DON’T TREAT A BOARD LIKE THE LAST BOARD. TREAT IT LIKE IT IS THE LAST BOARD."