

HANDLING LUMBER INTO, THROUGH, AND OUT OF THE DRY KILN

Robert R. Beckley
Lumber Systems, Inc.
Portland, Oregon

The basic elements of good lumber handling between the saw-mill, into the dry kiln, out of the dry kiln and into the planer-mill revolve around getting the lumber on stickers.

There are three categories that should be considered for handling of stickers and putting the stickers into the load.

1. Have good stickers with uniform thickness, uniform length, and uniform width.
2. Good sticker alignment, in the load, with the stickers placed one above another between the courses of lumber.
3. Properly spaced stickers throughout the load to either be supported by yard piled bottoms, or supported by lift truck forks in handling the load from one spot to another, or when placing the loads on kiln trucks, to ensure that the sticker alignment through the load is placed directly above the bunk on the kiln trucks.

There are basically two sizes of loads built for package handling of dry kiln loads -- either a 4 x 4 or a 4 x 6 stickered package. The main advantage to the 4 x 6 stickered package is that there are 50% less packages to handle to build the average 8' to 9' wide by 12' to 16' high load. In building packages, there are three criteria that should be kept in mind.

1. The package should be built as square as possible.
2. The even ends of the packages should be straight up and down, allowing the loads to be closely placed together in the dry kiln.
3. We have seen, in the southern United States region, a turn to 8' wide packages. These 8' wide packages are handled by lift truck, placed on kiln trucks, and built three to five packages high for a full crib load.

Handling between the stacker and the kiln. The main criteria are as follows:

1. In handling the loads from one spot to another or placing onto the kiln bunks, it is extremely important that the stickers be kept in the load. Proper speed, through an adequately surfaced yard, will ensure that the sticks stay in the load. However, too fast of transportation over a rough yard surface will jog many of the stickers loose in the ends of the load. When they are then placed into the kiln crib, the ends of the material are not properly supported, thus causing the material to become warped, broken, or crooked during the drying process.
2. Yard bunks should be placed so that they are in relationship to the wheels of the lift truck and to the sticker alignment in the loads. It is extremely important that the bunks be placed with the load over them with the sticker row directly on top of the bunks, or a fanning effect will happen causing a certain number of the sticks to fall out of the load.

Also, if the material is set on bunks that are not supported by stickers, there will be breakage of the lower courses of the material in the package.

3. It is extremely important, when placing material in the yard for air drying, that the stickers rows in the packages again be placed over good pile bottoms. These pile bottoms should be supporting not only the ends of the loads, but also a sticker row or two, possibly three depending on the length of the load, in towards the center of the load.

Loading the material on trucks.

1. Again the main criterion is to get the stickers over the bunks on the kiln trucks.
2. The loads, when placed one on top of another, should be straight up and down on the outsides to ensure that the top or bottom load is not restricting the air movement in the kiln because one being over or away from the edge.
3. There should be a center space between the two loads, placed on the kiln trucks, to allow the air to equalize and move uniformly through the full load width.
4. It is extremely important that the cross bunks be placed in the loads at the same height so that the top loads are then set on the cross bunks and are, again, straight. If the height of one load varies with the load beside it, then the cross bunks should be shimmed to get the top loads straight on the load.
5. Again, these loads should be placed in the crib load with the ends straight across, so then when two loads are pushed together in the dry kiln, there is not a space between the loads which robs the dry kiln of air circulation.
6. If it is necessary to put random length loads into the dry kiln and when there are large voids between any one crib and the next crib, these voids should then be covered.
7. We have observed in the south, and again in the Canadian region, full length kiln trucks. These trucks are built of one solid frame the full length of the dry kiln, and are loaded on one end with green lumber, pushed into the dry kiln, and taken out on the other end. Then, as the dry lumber is removed from the truck, it is again loaded with green lumber. These trucks rotate back and forth through the dry kiln in this manner. After observing the loading operation of several of these full length kiln trucks, it is apparent that this is a good system if it is completely lift truck handled and the material flow is not disturbed too greatly between the sawmill and the planer.

Loading the material into the dry kiln.

1. If crib loads are loaded into the dry kiln with either a car puller or a transfer car, it requires a good method of hooking the cable attachment to the crib load to pull it one way or the other into the kiln. Too many times poor cable attachments are used and stuck into the load, which damages or breaks off a certain number of pieces every time a kiln load is pulled together.
2. Car pullers should be used rather than lift trucks pushing the material into the dry kiln. Too many times lift trucks will have a tendency to be over powering and either push a

cart off the track or damage material in pulling the load into the kiln.

3. Make certain the ends of the loads are pulled tightly together in the kiln to again stop loss of air movement through the loads.
4. It is extremely important that dry kiln tracks be fully loaded and that they have end baffles that come into the ends of the loads to stop any loss of air movement around the end of the loads. Loss of air movement around the end of the load is doubly damaging in that it not only robs air that should be going between the courses of lumber, but it will also over-dry the ends of those that are exposed and causes excess end check.

Dry handling of the lumber.

1. Dry handling of the material is more critical when the material is on the kiln tracks, and is more subject to damage by poor cable attachment, lift truck damage, and so forth.
2. Again, it is more critical that the pile bottoms be so placed that the sticker rows, in the loads, are properly supported. Dry material is more brittle and will break more readily when placed upon pile bottoms where they do not have proper sticker support.
3. Again, in the dry, it is more important that the lift truck driver make sure that their sticker rows are directly above the forks of the lift truck. If he picks up a long load of material between the rows of stickers, you will hear the boards crack and several of the bottom courses will be cracked or broken.

Care of the dry kiln trucks.

1. One reason for problems in moving material in and out of the dry kiln is the lack of repair of bent or damaged dry kiln trucks. When a load of material is run off of a track in a dry kiln, there is always damage to the material as well as loss of production in getting the load back on the track before it can be properly moved.
2. The wheels of the dry kiln trucks should be properly greased in a regular rotation. If additional force has to be placed on the load to either slide or move loads that are on kiln trucks with dry bearings, then the requirement of horsepower is many times over that of movement on trucks that have been properly lubricated.

A complete closed loop system. There have been, in the past and are still some, completely closed loop handling systems from the sawmill through the planer. Such a system would include the following components.

1. Truck loading and truck removal chains to transfer the loaded cribs from the crib stacker.
2. Transfer chains to the transfer car.
3. Loading chains that automatically pull the load onto the transfer car.
4. Unloading chains for moving the loaded crib from the transfer car on to the dry kiln tracks.
5. Green track transfer chains, which transfer the material into the dry kiln.
6. Transfer chains for moving the loads through the kiln or into the kiln before drying and out of the kiln after drying.

7. Dry track transfer chains which move the material not only from the kiln, but also through the dry track area.
8. Dry transfer load and unload chains.
9. Load charger to the unstacker.
10. Load evening chains on the lift platform of the unstacker.

There are many advantages to the closed loop system in that the material is placed on the kiln trucks with the stickers in proper alignment to the kiln truck bunks, and is left in that position until the material is broken down into the planer.

Package handling. Each course, in a 4 x 4 package, represents approximately 5% of an 8/4 package, or 3% of a 4/4 package, and in a 4 x 6 package, each course represents approximately 3-1/3% of 8/4 or 2% of 4/4. In a 9 x 12 kiln load, one course is 2% of 8/4 or 1-1/2% of 4/4. The average board, in most operations, is a 1 x 8 x 16' or 10.7 board feet. At \$200 a thousand, this board is worth \$2.14. At \$400 a thousand, this board is worth \$4.28. This board in most instances will be worth somewhere in the range between \$200 and \$400 a thousand. The breakage of one board causes a minimum loss of \$2.14 or the loss can be over \$4.00.

Proper handling of the material through the handling system, from the sawmill into the planing mill, is a very basic. It's very unusual, though, to be able to go into any operation in the country and not find some area in that operation where the basics of good handling into, through, and out of the dry kiln are not lacking.