

## THE GREAT DEBATE — WHAT PRICE AIR CIRCULATION

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The lumber dry kiln, from outward appearance, is a very simple machine. It contains several design features which, when considered separately, appear to be quite simple in construction and function. For instance:

- The building looks much like a large, double-ended garage or truck shop, with doors on each end, but no windows, only a line of ventilators on each side of the roof.
- The building is well-insulated and has its own heating system for heating its contents.
- It also has its own humidification system to increase relative humidity when desired.
- The dry kiln even has its own miniature rail system for transporting loads of lumber to be dried into and out of the kiln.
- One more thing, a fan system is included to move the air efficiently around lumber surfaces so that uniform and rapid drying will occur. Also, a ductwork or arrangement of baffles are employed to properly direct the air.
- Finally, a set of controls are employed to properly control temperature, humidity and air flow to achieve an optimum drying environment within the kiln.

Perhaps, with some degree of understatement, the above description outlines a very simple machine; but despite its simplicity, it is not inexpensive, and it is often botched by kiln manufacturers who fail to approach its simplicity objectively. One area in its design most frequently violated is the air circulation equipment (fan system). It can turn into a very costly situation.

Unfortunately, due to its utter simplicity, the dry kiln is sold more like an automobile than as a basic piece of production process equipment. Little "goodies" are added, along with twists of "cute" design. The result often is completely missing the mark obtaining the performance sought after. The fan system frequently is chosen as the item to display glitter.

Buying a dry kiln is not just a matter of comparing prices and specifications written on a piece of paper, and it is not something to judge strictly on emotional appeal--yet we have seen mill owners and managers purchase a half million dollar dry kiln package with less study and research than when buying a personal car or pickup.

The dry kiln is a high energy user. Long after we have gone home to relax and get some rest, the dry kiln is plugging away, right on into the night, into the weekend. It is interesting to note that an average-sized West Coast mill, running two shifts, will operate approximately 4,000 hours per year. The

electrical load would be about 2,000 KW at 5¢ per KWH; this comes to \$400,000 per year.

Now, let's look at the dry kilns of that same mill. They operate almost every day, 24 hours a day, or approximately 8,400 hours per year. Should this mill also have one of our wood fired boilers, the fuel will be quite economical, but the boiler consumes electricity, also 8,400 hours per year, or over twice the amount of hours that the sawmill and planing mill run. The boiler electrical load is 75 KW, and the kilns 400 KW, or a total of 475 KW. At the same 5¢ per KWH, this comes to about \$200,000 per year, or roughly half of what the mill consumes; or to put it another way, 1/3 of total power consumed by the entire operation.

The dry kiln fan system is an area where substantial savings can be made. Most dry kilns on the market today have somewhat inefficient fan systems. Any new kiln you purchase should have a low energy, high efficiency fan system (one which I described at last year's annual meeting delivers the same amount of air for roughly 1/2 the horsepower).

This is not to suggest that you should replace your existing fan systems with the new low energy fans, but this should be a consideration in any new kiln you purchase. What is suggested here, for existing kilns, is to look at other factors in your operation which affect kiln air circulation--such things as quality control for lumber thickness, improving the quality and uniformity of stickers and proper stacking practice, including good sticker alignment, installing adequate air baffles in the kiln or simply repairing the existing baffles (if they haven't all been torn out).

To formulate a conclusion here, buying a dry kiln is not just a matter of finding the lowest price. With a wise choice of equipment, over the years, you can save your mill a lot of money--and remember, the money you save may be your own.