WHAT'S SO BAFFLING ABOUT KILN BAFFLES

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In recent years, with the reduction in available timber supply and log diameter, combined with increased costs, conifer mills have had to incur considerable costs to maintain a viable position in the constantly changing marketplace.

Most of the early changes concentrated on maintaining production levels from the smaller logs, which required higher piece counts and improved yield (less kerf; tighter tolerances); all of which required major investments.

As the industry continues to adjust to a changing environment and marketplace, management has had to be both creative and flexible in seeking out both raw materials and a profitable product line.

Thus, some coast mills now cuts alder part time, inland logs that have been transported 200 miles or more, radiata pine logs from Chile or New Zealand, and quite, possibly in the future, logs from Siberia.

In addition to the variable raw material sources as above, we now also have a wide potential product mix consisting of anything from alder, or fir/hemlock clears at 8 to 10% MC, to export 105mm squares at 18%, plus trim ends for finger joint recovery.

Not only has the above product mix made a direct impact on the sawmill and planer mill, but has also influenced the operation and/or design of dry kilns and their control systems requiring the industry to maintain an even more uniform set of kiln conditions.

This usually results in the installation of a multizone controller, and limiting the number of coils in a heat zone, while at the same time, taking steps to assure a uniform air flow top to bottom and end to end of the load.

This set of conditions can be, in effect, distorted by a tipped over or poorly placed floor baffle, let alone a missing ceiling baffle or two. In other words, a $400 baffle error can substantially undo a $30,000 kiln control system if not corrected.

Quite often, with a multizone controller, these difficulties can be identified and either corrective action taken, or at least notation made to do so after the charge is pulled, but be prepared to either overdry a considerable

quantity of lumber with an extended schedule to avoid wets, or acknowledge an increase in wet lumber at the planer.

With a conventional control system, your first clue to faulty baffling, if not a visual observation, may well be the complaint of wets at the planer or at best, when you verify moisture content readings prior to pulling.

In general, air will tend to flow the path of least resistance, thus in the case of missing baffle(s), air velocity may well be in the range of 800 to 1200 fpm through the open area, resulting in a reduced and distorted flow in the adjacent sticker slots. As this air flow is distorted, so is the heat transfer and thus, the drying uniformity.

The 3 most common kiln baffle arrangements are:

1. **Floor baffles** - Either fixed in place, or hinged flip away.

2. **Ceiling baffles** - Either fixed or hinged to lift out of the way.

3. **End (wall) baffles** - Usually 2 piece hinged.

In addition to the above mentioned standard areas of baffling, other areas that warrant your review are voids over or under heat coils or to adjacent walls.

1. **Hinged floor baffles** should, when in position, lay up full length against the bottom course at such an angle as to not fall or blow back over from the force of the circulating air upon fan reversal. Those of you with fixed floor baffles, such as poured concrete curbs, may well want to consider adding a sliding type baffle to push out against the load to totally block the bypass air from underneath.

2. **Ceiling baffles** should be designed to allow them to pivot and follow the edge of the load, always making firm contact full length as it dries and shrinkage takes place. **This includes clearing the top of the end baffle.**

   A. Also beware the trend to lightweight (aluminum) baffles in high air flow systems, where the air pressure can lift the baffle 3 to 6 inches off the load and not only allow bypass air, but **overdrying** the top of the load.

   B. Ganging baffles to common sprocket or driven lifting mechanism requires periodic checking to verify baffles clearing load sufficiently when raised to avoid being torn off by the moving load.

3. **End baffles** not only should stay clear of the ceiling baffle travel arc as the load shrinks, but the bifold hinges should allow surplus baffle width to fold back in under the fan deck, **not out** towards the side wall.

Folding out produces a "V" shaped scoop at the top of the baffle to route bypass air around and across the load end, causing end checking/splitting.

Additional areas to consider for baffling would be any place where a large volume of air can bypass either the lumber load or your heat coils. Examples of the latter would be openings 1 foot wide, or wider, between the fan deck and your heat coils or the kiln wall and any heat coils.

Remember, air will normally take the route of least resistance **(bypass)**, where it does the least work.