



# Kiln Clinic

April 7-8, 2009 – Lake Placid, NY

## Question: Re-drying KD wood

- i.e. 5/4 white oak, re-dried, surface checking showed up. Equalized and re-conditioned to close up checking. Were they too aggressive on re-drying?
- Hard to damage wood when it is at a low MC. If wood is not damaged when it reaches i.e 20% you are not likely to cause damage.
- Re-wetting and re-drying may cause checking that pre-existed to become worse.



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Question: Re-drying KD wood, cont.

- If surface check is deeper than re-wetted zone then it was probably there beforehand.
- Conditioning is not intended to close checking.
- Re-conditioning may close the checks at the surface but drive it in deeper.



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Question: Current studies on brown stain – new info

- Nexgen has been demonstrated to reduce brown stain
- Traditional ways: stay away from thick pine in the summer i.e. after April 15. Keep temperatures lower i.e. less than 120. Winter cut logs have less problem
- What is difference between summer and winter cut material? Is pitch different?



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Question: Current studies on brown stain – new info, cont.

- Balance between low RH to avoid stain vs. drying too fast and causing checking.
- A lot we don't know about staining mechanisms at this time



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Question: Fan speed for hard maple above and below 20% MC

- Safe to reduce to 200 fpm or less when wood is below 20%.
- Need information on current airflow at full speed before deciding how much you can reduce it
- Doing things to improve airflow may give more room for airflow reduction i.e. improved baffling.
- Can use TDAL as a means of estimating when it is safe to reduce airflow.



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Question: Fan speed for hard maple above and below 20% MC, cont.

- Gradual decrease in airflow is better
- Need to consider drying rate and staining issues
- Minimal reduction in airflow will result in large decrease in electrical energy
- Balancing of fans to improve performance
- Maintenance needs i.e. check bolts for tightness
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Question: 8/4 pine airflow needs – will lower fan speed increase drying time

- Currently at 800 fpm, @ 600 fpm reduce to 40 amps. Will dropping fan speed from the outset cause problems for drying?
- Load width is only 14 feet
- TDAL is a good indicator again
- Potential to use vent opening as an indicator of impact of airflow



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Question: 8/4 pine airflow needs – will lower fan speed increase drying time, cont.

- Use sample weighting system to measure weight change (drying rate) at different fan speeds. Run test through an entire fan cycle.

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## Question: Certification for drying firewood

- Need for certification for firewood by USDA.
- Emerald ash borer and other pests are becoming more prevalent.
- APHIS website has procedure for certifying a chamber for firewood i.e. detailing cold spots, no. of probes, etc.
- 160 F. for 75 minutes is required



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Question: Certification for drying firewood, cont.

- problem with firewood is the way the material is stacked or piled in the chamber.
- Variability in product going into the kiln may be an issue
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Question: Density of woods i.e. hickory (variability)  
MC variability, sampling

- Material originating from many sources and has wide range of density. Final MC on heavy stock a little higher.
- There are several hickory species that help explain the variation in density
- Address variability by equalizing but this extends drying time



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Question: Density of woods i.e. hickory (variability)  
MC variability, sampling, cont..

- Select range of samples, rings per inch may be an indicator of dense vs. less dense pieces
- Use a moisture meter to get a better picture of the final MC distribution. Pre-drilling may be required.
- Try to develop rules to visually select pieces in the green condition i.e. colour



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Question: Drying red pine poles – any experience?

Need 25-30%

- Drying outer portion only i.e. 3-inches of sapwood. Max. temperature about 130 F.
- Southern pine poles, heat rapidly with vents closed and drying in 2 to 3 days. Drying at higher temperature increases moisture holding capacity of air (reduces EMC). Open vents after the first day (approx.)
- Run at 10 to 15 deg. F. depression as a guideline
- Keeping EMC higher promotes migration of free water through the wood



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Question: Drying 16/4 red oak

- Put in a pre-dryer and give it some time. This may be difficult to control EMC to the required level.
- Need to be careful with regulating the moisture gradient
- Suggestion to put it in a kiln from the outset. Airflow is critical. Avoid having steam spray on that would aggravate checking.
- Accuracy of sensors and control system is critical.
- Consider doing a double shell and core MC test



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Question: Drying 16/4 red oak, cont..

- Need to consider core MC in making schedule changes
- Used to use salt treatment on outside of wood to keep surface MC higher
- Heat very gradually to avoid aggravating checking
- Do intermittent stoppages to equalize the MC through the cross section



# Kiln Clinic

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Question: Biofuels. Green movement. Where are we heading?

- Restrictions on movement of materials.
- No problem with movement of pellets
- Gasification technologies being developed to produce fuels that can be used in various applications i.e. direct-fired kilns
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Question: Conditioning lumber when you are heat treating it. Do you condition it the same?

- For white pine need to differentiate between conditioning (stress relief) vs. equalizing
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Question: When is it safe to reduce fan speed to save energy?

- TDAL rule of thumb: High TDAL = fast drying rate and the need for higher airflow



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Question: Cupping in white pine. How to reduce it?  
Roller check in the winter. (6-8:

- Impact of piling. Unsecured boards will be more likely to cup
- Boards from close to the pith will have greater tendency to cup.
- In winter the wood is less pliable and will split more readily
- Drying more aggressively may provide some resistance to cupping
- Conditioning may help straighten boards if enough moisture is re-absorbed.
- Place higher grade lower in load to provide more restraint.



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Question: Experience on in-kiln probes for hardwood

- Used as a shutdown tool on softwood kilns
- Tighter MC targets on hardwoods may make this problematic.
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Question: