Kiln Clinic

October 28, 2008 – Waterville, ME

Question: Thermocouples to RTD's – any experience with changing over?

- RTD should be more stable
- RTD has a tighter temperature range
- RTD more expensive
- thermocouples can be set up easily for a quick test of temperature uniformity
- thermocouples are less durable and prone to corrosion
- can use heat shrink over thermocouples to protect them

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October 28, 2008 – Waterville, ME

Question: Percentage of steam recovery back to the boiler

- steam condensate back to boiler
- insulate the condensate return tank to save energy
- vent exchangers at Robbins noticed significant difference in steam demand with and without heat exchangers. Do use some electricity to power fans for the heat exchanger
- More or faster payback on woods that vent a lot i.e. white pine
- Temperature difference between kiln and outside will increase efficiency

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October 28, 2008 – Waterville, ME

Question: Who has a good 8 quarter birch schedule. Along with fan speed information

- can use same as 8/4 maple schedule to preserve the color
- limit temperature to 120 or less to maintain color
- drying rate will slow below 20% MC – raise temperature slowly
- schedule in Kiln Operator's Manual and maple publication by Wengert
- watch drying rate to avoid slow drying and darkening
- rise in temperature during conditioning should not cause problems for color

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October 28, 2008 – Waterville, ME

Question: Best practices for storing KD lumber

- EMC and time – wood will gain moisture if left long enough
- drying to 5 – 7 and after 6 months will be at 9% or higher. Interior of package will still be dry at 9 months
- deadstacking will slow down the process – moisture will penetrate through sides and ends
- can wrap in plastic to slow down the process further
- higher density wood will take longer to pick up moisture

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October 28, 2008 – Waterville, ME

Question: Lowest pressure to run a turbine

- Robbins requires at least 165 lbs. steam but every turbine is different
- micro turbines run at lower pressure
- some will run down to 5 psi i.e. with a vacuum pump to draw steam through
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October 28, 2008 – Waterville, ME

Question: Experience in drying unedged and un-trimmed boards re energy,, time, etc.

- drying wood that will not be used
- energy usage will be higher
- kiln productivity will be reduced
- potential increase in recovery due to more dimension parts
- wasted space and gaps in load which could cause unequal drying
- one experience showed 33% increase in capacity required.

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October 28, 2008 – Waterville, ME

Question: Adequate spacing of KD lumber for outdoor storage

- protect from re-wetting and sun – pile covers, under a roof
- wraps are good unless or until they get torn when moisture can then get in and get trapped
- need to consider EMC and location of wood
- consider final EMC i.e. 12% may be okay outside but not 6-8% MC
- solid stack and pack tightly to slow down MC gain
- many site specific factors to be considered
- wrap typically covers sides and top, therefore,

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October 28, 2008 – Waterville, ME

Question: Heat exchangers – other people with experience. Impact on drying

- Several different forms of heat exchangers, heat pipe type, plate type
- central vs. individual heat exchangers
- claims on better quality of wood dried in kilns with heat exchangers
- energy savings from 10 to 25% some claims even higher
- free up steam for a new kiln
- some VOC's captured in condensate
- VOC's more of an issue for softwoods

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October 28, 2008 – Waterville, ME

Question: Does blue stain mean you will also get brown stain

- different stains i.e. blue stain fungal vs. brown stain chemical but both are caused by similar conditions
- blue stain can start at temperatures as low as 50 F.
- brown stain becomes more of an issue at higher temperatures i.e. 80-90 F.
- blue stain a good early warning indicator
- keep entering air temperature below 120 F. for first 72 hours
- limit outdoor exposure during warm months, can

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October 28, 2008 – Waterville, ME

Question: Re-drying lumber that has re-gained moisture i.e. deadpacked

- can re-dry in the kiln in deadstacked condition
- moisture gain was on outer surfaces therefore it will dry out in the same fashion
- if material has regained water from rain or melting snow it will likely need to be re-stacked and dried
- test with meter to determine MC patterns to determine if wood has re-gained moisture or if it was not dried properly i.e. wetter core generally means that the wood was not dried properly
- slower economic times require closer attention

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October 28, 2008 – Waterville, ME

Question: Hairline cracks in E.W. pine – causes?

- differentiate between shake and stress related checks
- shake develops in tree but does not become apparent usually until after drying
- stress checks extend across the annual rings
- conditioning/equalizing will cause checks to close up and may appear as hairline checks
-

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October 28, 2008 – Waterville, ME

Question: Heat treating E.W. Pine

- see Marc Moore's presentation
- HT schedules available from several sources but often need to verify
- heat treating firewood is now required in some areas and we will need equipment and a means of verifying heat treatment

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October 28, 2008 – Waterville, ME

Question: Use of VFD's and impact on drying time quality, etc.

- certain species can tolerate lower airflow at different stages i.e. maple needs more than oak
- slower start is easier on motors
- objective should be to not impact drying time or quality
- starting point i.e. airflow that you have must be considered. If airflow is only 200 to 300 fpm a VFD will probably not be an advantage
- fibre saturation point is the MC range that airflow can start to be reduced.
- lowest airflow in the range of 200 to 300 fpm

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Question: Drying firewood in a kiln

- problem is that material is not stacked and there are no channels for airflow
- material usually dropped into wire baskets
- variety of species and sizes
- what are you targeting i.e core temperature, a specific MC, etc.
- consider where material is being sent and what the customer's needs are
- take advantage of end grain to achieve rapid drying

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Question:

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Question:

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