

New Kiln Considerations



Bob Little



General Considerations

🌲 Lumber properties

🌲 Pack properties

🌲 Site properties

Lumber Properties



Species

-  Corrosive?

-  Safe drying rate

Initial MC

Thicknesses

Sawing pattern

Quantity to be dried annually of each type

Species – Corrosive?

- ✿ Drying mainly corrosive species (oak, balsam fir)
 - ✿ Consider spending extra to reduce maintenance costs
 - ✗ All stainless interior or concrete walls (pre-stressed or tilt up w/stainless door interior)
 - ✗ Stainless fin pipe
 - ✗ All concrete within 3' of floor coated with coal-tar epoxy

Species - Drying Rate

Fast drying from green with few defects (poplar, soft maple)

- ✿ Air speed: min. 500 fpm on leaving side of load
- ✿ Venting: large conventional modulating vents or power vents
- ✿ Heating: min. 60 Btu/hr/bf

Slow drying from green with defect potential (oak)

- ✿ Air speed: max. 350 fpm on leaving side of load
- ✿ Venting: normal modulating vents
- ✿ Heating: 40 – 50 Btu/hr/bf

Initial Moisture Content

- ✚ Entering MC typically above 30%
 - ✚ Max. 16' - 18' air travel through load (track, center fan wall, center re-heat coil, etc.)
 - ✚ May be more corrosive
 - ✚ May benefit from increased venting
 - ✚ Will dry faster and more uniformly with increased heat and air flow

Thicknesses Dried

- ❖ Generally thicker lumber will not benefit from higher cost items such as short air travel, large heating and fan systems, and excess venting capacity
- ❖ If lumber at or above 8/4 makes up a large percentage of what is dried, more holding capacity may be necessary due to longer drying times

Sawing Pattern

☛ Quarter and rift sawn:

- ☀ generally dries with fewer defects than plain sawn
- ☀ will dry more slowly than plain sawn – all other things being equal.
- ☀ may not benefit from higher performance kilns

☛ If rift and quarter makes up a large percentage of what is dried, more holding capacity may be necessary

Annual Throughput

- ❖ Mixing species, thicknesses, and MCs in the same charge should be avoided
- ❖ The more different types of lumber dried, the more smaller kilns are justified
- ❖ Kilns should be sized and equipped based on their ability to meet annual throughput demands for each condition/species dried

Pack Properties

🌲 Precision end trimmed?

- ☀️ If all packs are double even ended, side-to-side interior clearance can be as little as 2', 4' should left for single even ended
- ☀️ When sizing, manufacturers assume 80 – 85% loading efficiency

🌲 Lengths – see above, determines inside width

- ☀️ Number of layers, stick thickness, bolster size, etc – determine fan deck height
- ☀️ 4 feet loading clearance usually left between top of top pack and bottom of fan deck
- ☀️ Be sure to figure total pack height w/lumber at typical MC

Now this is how you load a kiln!



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Site Properties



- ✿ Available space
- ✿ Infrastructure
 - ✿ Steam supply
 - ✿ Electrical
 - ✿ Roads and loading areas
 - ✿ Other drying equipment
- ✿ Lumber handling equipment
- ✿ Local component manufacturing

Available Space

- ❖ Load bearing capacity of soil must be known
- ❖ Package kilns require the least amount of land per holding capacity: kiln footprint plus a 30' apron
- ❖ Center fan wall kilns (doors on both sides) require two 30' aprons
- ❖ Track kilns require 3 times the length of the kiln to provide loading and unloading space
- ❖ Regardless of kiln design other considerations that require space include pre-staging areas, room for cooling sheds, etc.
- ❖ Is room for a door extension lentil needed?



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Infrastructure



❖ Steam supply

- ❖ Ensure sufficient boiler capacity
- ❖ Steam pressure vs. piping distance

❖ Electrical

- ❖ Ensure sufficient capacity – VFDs @ 100% save no electricity
- ❖ Lighting for after hours operation

❖ Access

- ❖ Concrete is expensive BUT be sure to plan for loading/unloading areas, truck access, maneuvering room

❖ Other drying equipment

- ❖ Consider distance to other kilns, yards, predryers, fan sheds, etc.

Lumber Handling Equipment

- ❖ Mast height of forklifts vs. door header in conventional and center fan wall kilns
- ❖ Fan deck height vs. top layer of top pack plus maneuvering room
- ❖ Load center rating of forklifts at max. mast extension vs. weight of heaviest pack
- ❖ Flat approach to kiln – a must
- ❖ Do lifts have/need side-shifting and slope piling capability?
- ❖ Specify flexible baffles rather than rigid fixed baffles
- ❖ Smooth interior walls are a big plus



Final Considerations

- ✿ Before deciding that more kilns are needed, think about what is needed:
 - ✿ Cheaper to upgrade existing kilns to provide increased throughput?
 - ✿ Would a predryer be a better choice?
 - ✿ Is increasing dry storage a lower cost alternative?
 - ✿ Will your climate support the use of a fan shed?