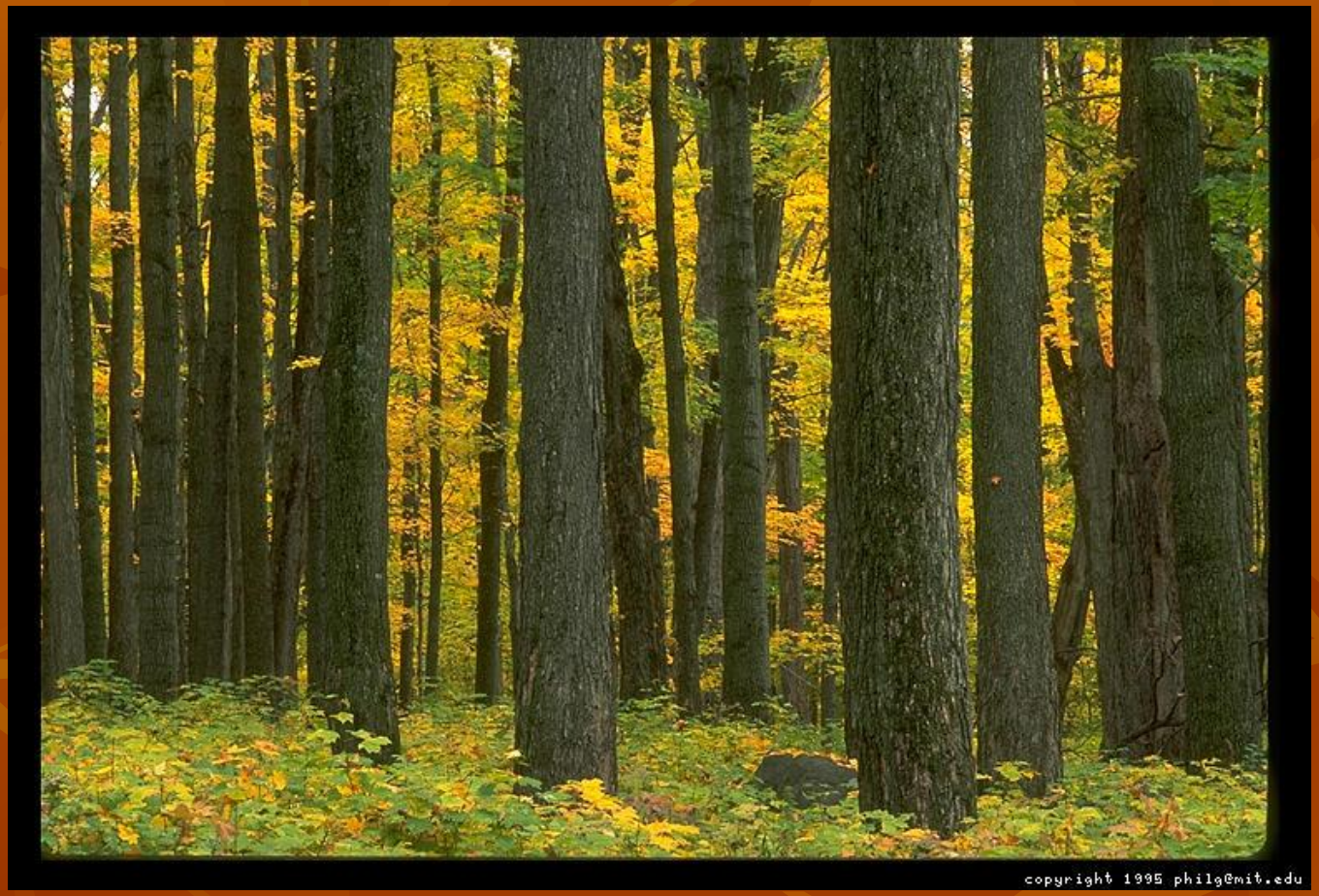
“Moisture & Wood”

“From the Forest to the Kitchen”

Forest: Where Wood Begins



Hard Maple Trees in a Michigan Forest

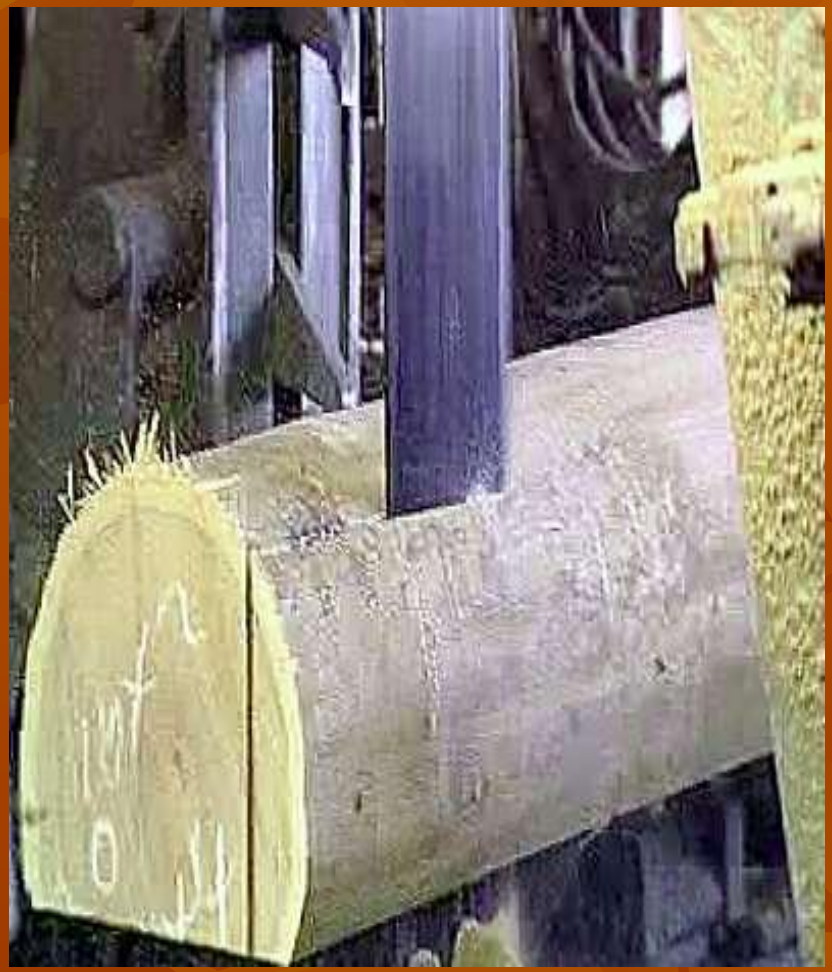
Full of Moisture

Harvesting Timber:

Quality starts from the very beginning. Logs must be handled and stored carefully until they are sawed into lumber to assure quality.

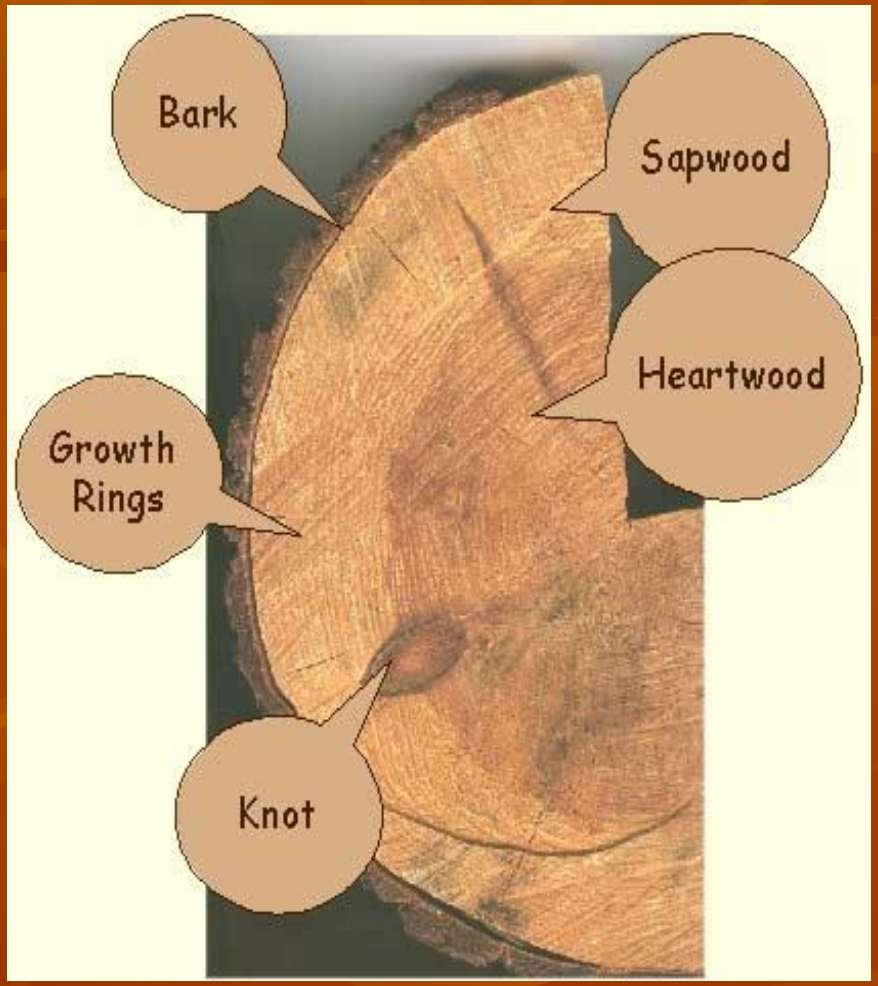
Sawing Logs into usable Lumber:

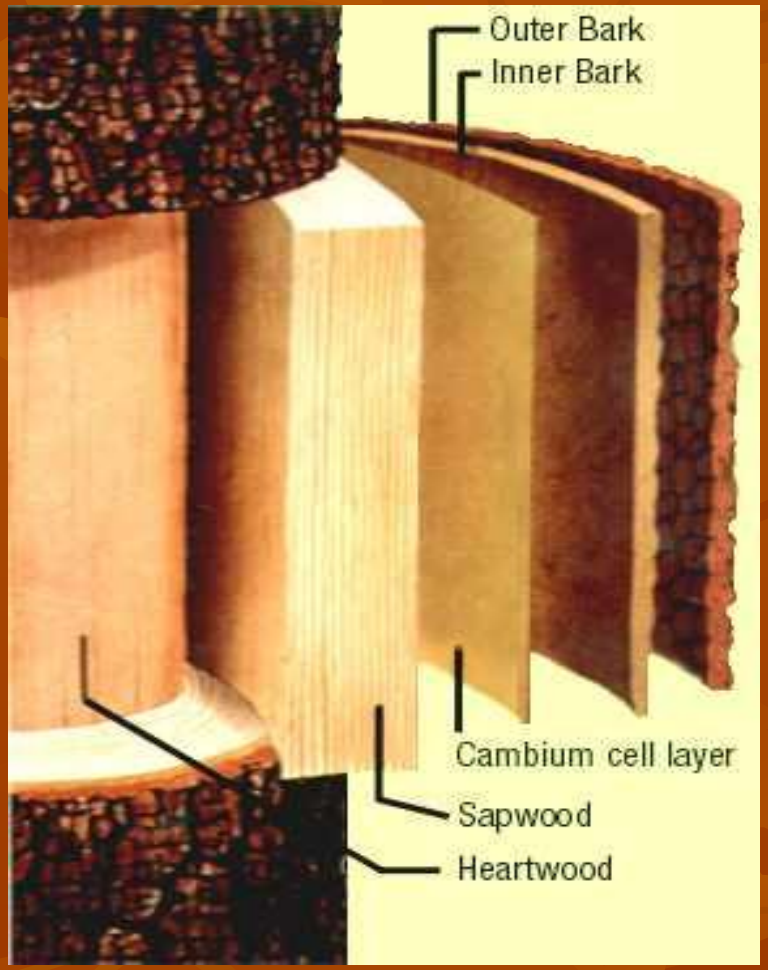
Circular saw mill



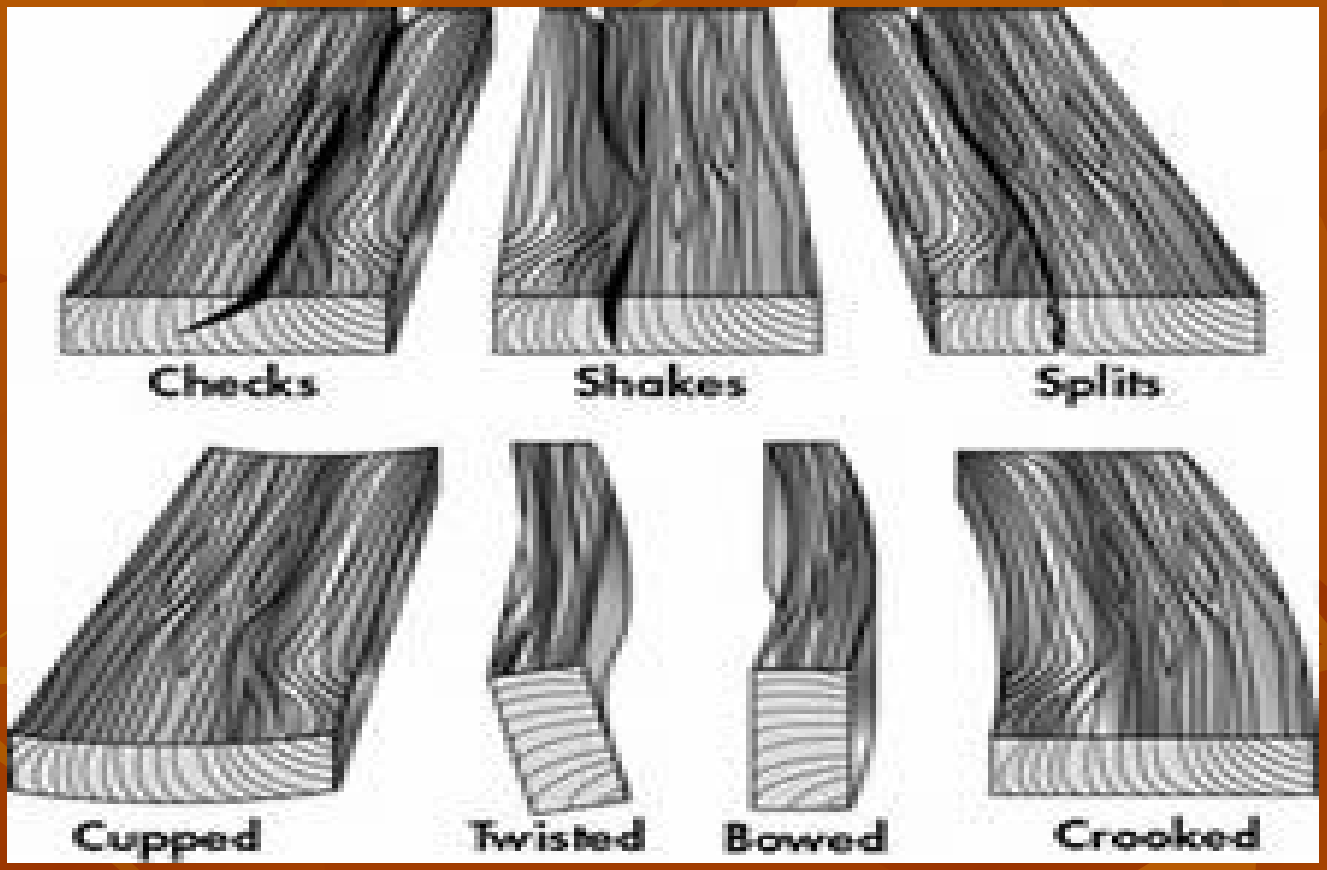
Band saw mill

Understanding the Tree's Different Properties





Moisture Related Defects in Wood



Absorbing too much moisture, or severe moisture loss can both cause moisture related defects.

Kiln Drying the Lumber:

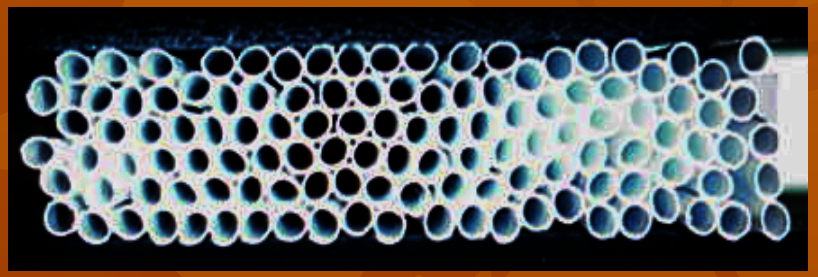
Lumber is dried in a kiln to 6% to9% moisture content.
Each specie has it's own special drying process.

What is Wood?

- Always containing water, it is constantly exchanging water vapor with the air, picking it up when the humidity is high, and releasing it when it is low.
- Wood swells when it absorbs moisture, shrinks when it loses moisture. For this reason, both it's moisture content and dimensions are controlled by the relative humidity of the surrounding air.
- We dry our lumber to between 6% and 9% with a target of 7%.
- We try and maintain our plants at 7% EMC (Equilibrium Moisture Content) 35%to 40% relative humidity.

Wood - What is it really?

- **Wood is like A bunch of straws!**



- **“Open on the ends” and “sealed off on the sides”**

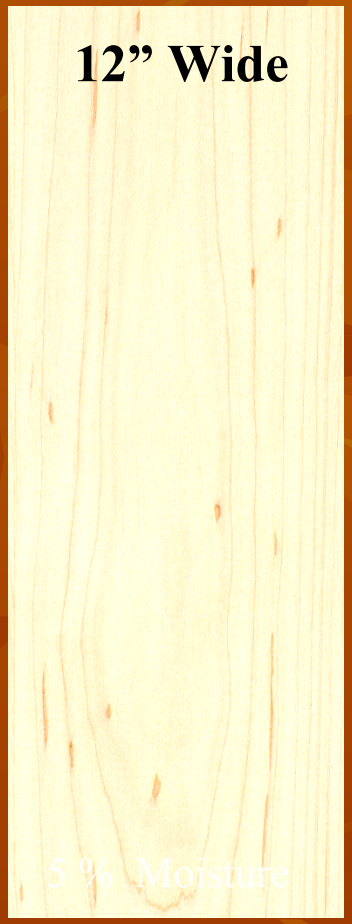
Wood – Is also like

- **A sponge!**

- **“It will expand as it absorbs moisture, and will shrink as it dries out and losses moisture”**

Species Expand Differently

Cherry

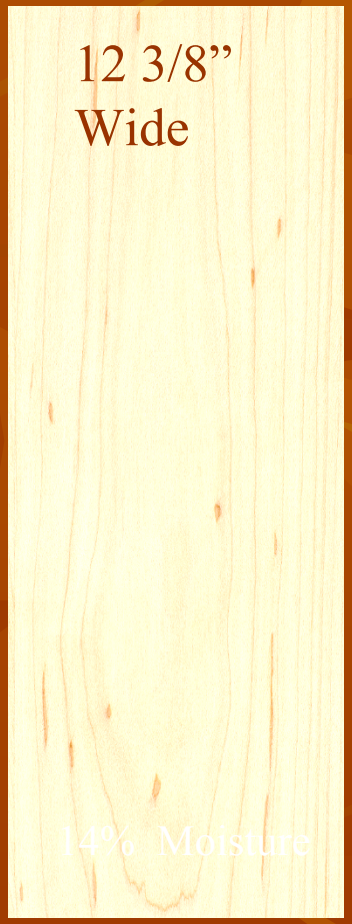


Hard Maple

Red Oak

After a 9 % Increase in Moisture

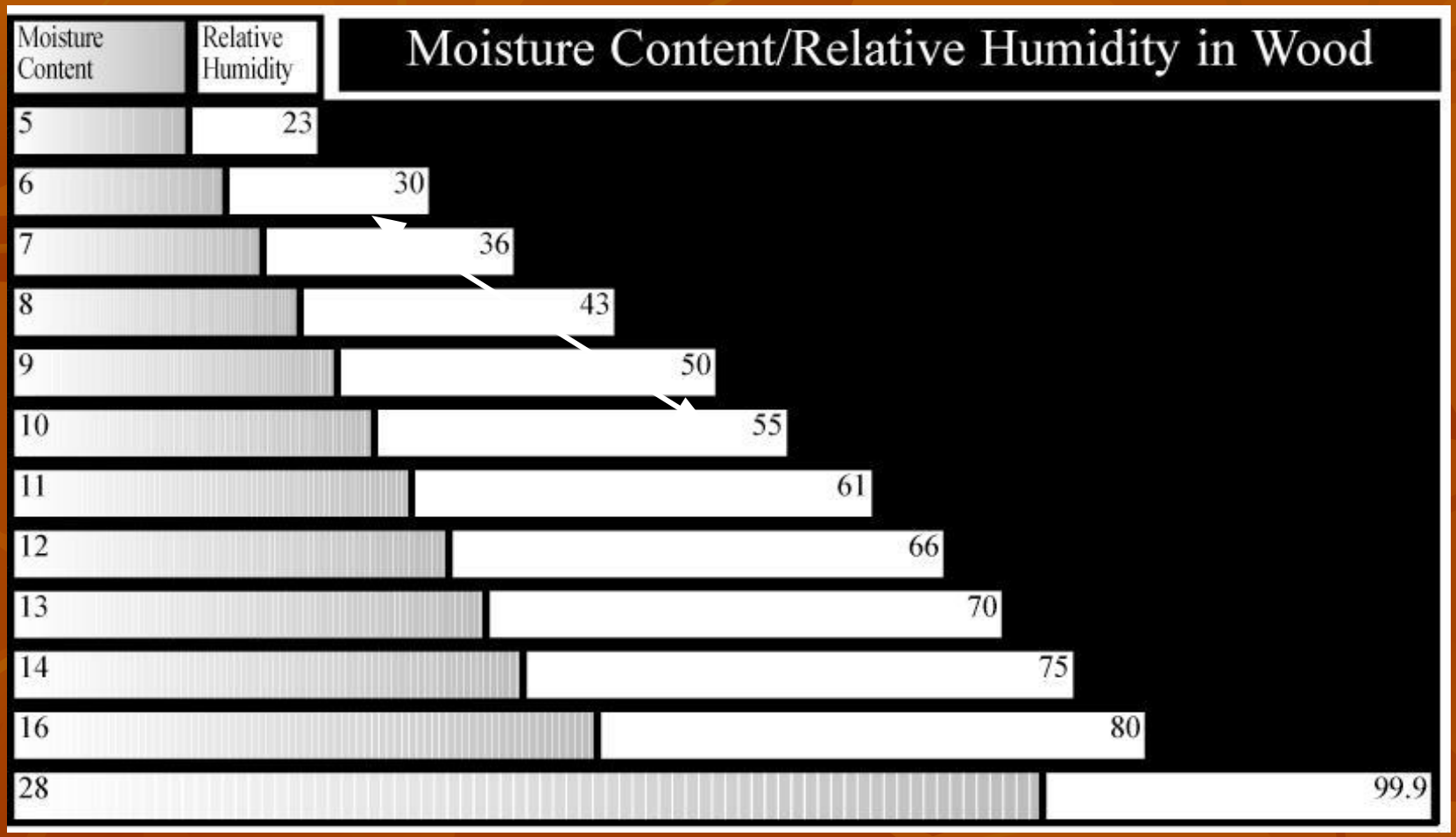
Cherry



Hard Maple

Red Oak

Woods Expand Differently



To maintain a 6% to 9% MC, the RH must be 50% or Less

Which directions will the Door Expand?

Framing will expand outward in all directions. This is the reason why paired doors or inset doors hit each other or get tight inside the front frames.

The door is designed for the panel to expand. The panel is glued in the middle of the rails allowing the panel to move both ways for seasonal expansion.

How do Mitered doors Expand?

Framing will expand outward in all directions.

Mitered doors usually have wider framing.

They are specifically designed to have a small opening in the inside corner (.015 max.)

This opening will close first during expansion before putting pressure on the mitered joint.

Miter Door Expansion

- Because of the wider framing and the end grain of the stiles fully captured these doors grow differently.
- The framing on these doors seams to bow out give a barrel shape appearance

Moisture Effect on Painted Doors

- In cases with increased moisture, panel staves are effected.
- A combination of staves growing at different rates and a slight increase the Radial direction are highly visible in Painted doors
- Framing joints will also be more visible with increased moisture
- Kitchen Craft now uses MDF panels on painted doors to eliminate this issue.

What affects moisture in a house?

1. Is the house located in a “high risk” area? Near Water?
2. Is the house under construction? If yes, are the windows installed? Are the windows open a lot of the time?
3. Are they still putting up dry wall or painting in the house?
4. Is the home climate controlled yet? Air conditioning? Dehumidification?
5. Where is the new kitchen being stored during construction? In the Garage? Was there new cement poured on this site?
6. Do they have an indoor pool? Or hot tub close by?

Question?
When should a kitchen be Installed?

Answers:

1. **Windows and doors installed.**
2. **Drywall is all done.**
3. **Painting is all done.**
4. **Cement work is mostly cured.**
5. **Home is climate controlled.**

House on Lake: Risk or No Risk?

Risk! Humidity levels are always the highest around water.

Dry Walling & Painting Not Completed : Risk or No Risk?

Risk! Dry walling and painting give off a lot of moisture in a closed up house when drying. Just waiting to get absorbed by something.

New Cement: Risk or No Risk?

Risk! Cement is approximately 50% water and takes 40 days for cement to totally cure.

They have a Pool: Risk or No Risk?

Risk! Prime source for humid air to get into the house when windows are open.