

# How Moisture Affects Wood



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By nature, wood is designed to absorb and lose water to balance its moisture content. All wood is hygroscopic, meaning that when exposed to air, it will release or pick up moisture to reach equilibrium with the humidity and temperature of the air. Because of this, wood tends to expand as it gains moisture and to shrink as moisture is lost—but not equally in all directions.

Any solid wood or wood component will continually expand or contract over time with changing moisture and climate conditions. In an uncontrolled environment, wood is a dimensionally unstable material.

Some wood species are more hygroscopic than others and the expansion and contraction is more pronounced. A “finished” piece of wood that is coated with stain, sealer and top coat, is not impervious to moisture. Much like a wood table will absorb water from a spill or have a moisture ring left on it from a drinking glass, cabinets will take in moisture through contact with liquids or absorption from the air.

## **Humid Climates**

Wood products located in humid climates are especially susceptible to expansion due to the extra moisture in the air. The wood will absorb this moisture, causing it to swell or expand. If doors are exposed to excessive moisture for an extended period of time, they may not resume their original size.

## **Dry Climates**

In low humidity conditions, wood will release moisture and shrink or contract in size. During winter in the colder areas of the country, cabinetry will shrink from the dry heat supplied from home heating units. As wood loses moisture, gaps will appear at joints between cabinetry pieces. Painted doors will also reveal seams at the joints as natural wood movement occurs.

As cabinetry regains its lost moisture under humidification control or during summer months, these gaps often close and become less noticeable. This occurs with all wood products in the home – furniture, millwork and cabinetry.

## **What Can I Do To Help Avoid Moisture-Related Problems?**

- Proper climate control within the home can greatly reduce the occurrence of moisture-related problems.
- Keep in mind that cabinetry in non-air conditioned or humidity-controlled homes in areas of high humidity will expand.
- Remember that second homes should always be maintained with some type of climate control, even when not occupied.

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### What Can I Do To Help Avoid Moisture-Related Problems?

- Choose a wood species with a low dimension change coefficient for homes in areas of risk. (See Hygroscopic Characteristics of Wood Chart below.)
- Excessively dry or humid areas should also avoid wood slab doors. Slab doors are constructed of solid pieces of edge-glued wood which can magnify the effects of expansion and contraction. A good alternative to this door style is a wood veneer door with solid wood edging.
- To avoid potential problems, we recommend that you maintain the relative humidity in your home in the range of 40% to 50%. Extreme variations in humidity will cause problems. When changes in humidity are minor, the dimensional response of the wood will be insignificant.
- The temperature in your home should also be maintained within a range of 60 – 90F. Cabinetry should not be too close or directly facing air vents or radiant heat sources.

Under normal fluctuations in temperature, you can depend upon your cabinetry to perform and look beautiful for many years. Our warranty does not cover damage from exposure to extremes in temperature or humidity, or product concerns related to improper control of humidity/ moisture levels.

Hygroscopic Characteristics of Wood			
SPECIES	DENSITY (lbs/ft <sup>3</sup> )	Dimension Change Coefficient	
		RADIAL <i>Across Growth Rings</i>	TANGENTIAL <i>Parallel to Growth Rings</i>
Maple	42.5	0.00165	0.00353
Cherry	35.0	0.00126	0.00248
Alder	27.0	0.00151	0.00256
Beech	43.7	0.00190	0.00431
Hickory	50.5	0.00259	0.00411
Oak	42.5	0.00158	0.00369
VG Fir	34.7	0.00165	0.00267

Dimension change coefficient is the percent change per inch per 1% change in moisture content.

Source: Woodcraft Industries, Inc.

