THE *BEHAVIOR* OF SOLID WOOD FURNITURE

Wood is dynamic material. Some say that it is still “living” even after it is made into furniture. Unlike composite materials and stone, it is constantly adapting to its environment and actually changing weight, shape and size. For instance, a 42” wide table can change 3/8” of an inch in width over the course of a year as the relative humidity in a living space varies with the seasons. Sometimes one surface of a wooden component will receive a different exposure to seasonal changes than the other side and a slight warping or “cupping” might occur. “Cupping” and warping are minimized by engineering the furniture so that wide expanses of hardwood, such as table tops, are stabilized by other components that run across the width of the panel and limit the extent to which the wider panel can move. We also retard variation in moisture content with the application of moisture resistant **Greenguard finishes.** While engineering solutions can limit changes in shape they will never totally eliminate them and some movement is to be expected.

Some interesting facts about solid hardwood furniture and how moisture and humidity effect it:

- The hardwoods we use to make furniture have been dried to 6% - 8% moisture content.
- The equalized moisture content (EMC) of a typical living environment varies from a low of 4% to a high of 11%.
- The range in environment humidity impacts the moisture content of everything in it. For example, when a 42” x 84” Axis Dining Table leaves our factory it weighs 120 lbs. 8 lbs, 6 ounces of that is water.
- If exposed over a long enough term to the driest residential environment (heated air in a winter climate) it will lose about 3 1/2 lbs. of water.
- Exposed to a high humidity environment (un-air conditioned beach house) it will gain 3 1/2 lbs. It almost never reaches those extremes, because the driest and most humid seasons usually only last for several months and moisture resistant finished retards drying and uptake of moisture.

Think of the cellular structure of wood as bundles of long narrow tubes. As the moisture content of the cells is reduced the tube shrinks in width but not length. With this variation in moisture content, solid wood furniture shrinks, expands and moves. The movement is small and happens slowly and often time it is never noticed. For each 3% change in moisture content of finished wood the width of the wood will change 1% in its width. That means that if we make a table 42” wide out of lumber that is 8% moisture content, and it is left long enough in an environment with 11% EMC, it could expand by 3?8” in width. In extreme to the other, the change in width would be 3/4”.