

# Drying Cross Sections of Trees

## By Sidney Boone, Wood Technologist (retired) USDA-FS-Forest Product Laboratory

The following article is excerpted from a letter written by Sidney Boone, a wood technologist at the USDA – Forest Product Laboratory in Madison Wisconsin. The letter was a response to an inquiry on how to prevent cracking in cross sections (disks) of trees as they dry.

We know of no certain method of drying large cross sections that will guarantee no cracks. The one defect that often appears is a large edge-to-center “V” crack. In addition, there are usually many short radial cracks over the disk face. Sometimes cutting the slabs at an angle to axis of the tree reduces the tendency of the slab to “V” check.

The method recommended most in recent years is stabilization of wood with a bulking agent, polyethylene glycol (PEG). The method is slow, does present some problems in finishing, and currently the chemical is expensive. In addition, this method is not always successful in preventing cracks and checks.

Another method that has met with some success is salt drying. Residual salt can cause corrosion of fasteners; however, for disks this should not be a problem unless they are mounted on metal and displayed in a humid location.

We have been experimenting with slight modification of salt drying. Several applications of saturated salt solution (salt crystals visible after thorough mixing—about 3 pounds salt per gallon of water) are brushed on alternately on both sides of the disk, allowing several hours for the solution to penetrate. Following this is a thick paste of cornstarch and saturated salt solution is spread on each face.

We have found that the addition of several egg whites acts as a convenient binder to reduce the flaking of the paste after it dries. The purpose of the paste is to help prevent the surface fibers from drying and thus shrinking so rapidly as to cause checking and cracking. Using this technique, we have recently dried 32-inch American Elm disks (4 inch thick) at low relative humidity and normal room temperature. The moisture content was brought down to 5 percent in 30-45 days with no “V” crack and only a few minor radial hairline cracks.

If drying is done without any treatment, the following guidelines will be useful and some of them will reduce the likelihood of checking.

1. Use temperatures close to room temperature for the early stages of drying.
2. Use high relative humidity in the early stages of drying.
3. Thin disks (2 inches or less) are less likely to crack than thick disks, but tend to dish in drying.
4. Thick disks dry very slowly (doubling the thickness increases the drying time by 3-4 times).
5. The basic cause of the “V” crack is the difference in radial and tangential shrinkage of wood. Choosing species with a low ratio of tangential-to-radial shrinkage will minimize the tendency to form the large “V” crack.