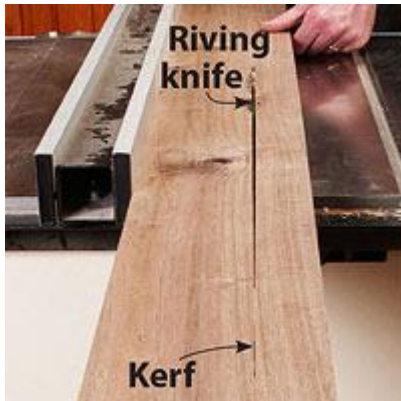


Woodworking Tips

Stress management in timber

You've been there. You pick out the perfect timber from the hardwood dealer for your weekend project -- right size, right color, and right figure. But when the weekend rolls around and you cut into that timber, the board that rolls off is anything but straight and square. To minimize your stress in the shop learn to recognize, avoid, and counter the three main causes of stress in wood.



Powerful internal stresses in this Walnut board closed the Kerf tightly as the board came off the blade. Fortunately, the riving knife prevented binding, burning, Motor strain, and kick-back.

Growth stress

Fence-row trees lean toward the sunlight on their exposed side. Hillside trees struggle to grow in line with gravity. Windblown trees fight to stay upright. Though these awkwardly growing trees may look normal from the outside, they strain internally to do so. In your

workshop, boards milled from trees like these release their pent-up stresses immediately as you machine them, as shown on the *first page*, bending in often unpredictable and frustrating ways.

Most lumber from high-volume hardwood dealers comes from managed forests containing few growth-stressed trees. If you do encounter stress, save the wood for small parts. The less wood in the part, the less pent-up stress and warpage potential. Cut oversize; then joint, plane, and sand to final shape

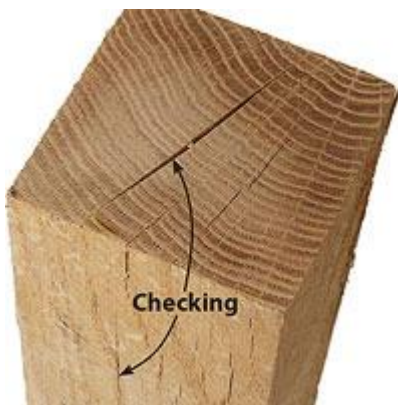


An off-center pith shows this tree's awkward growth. Irregular rings on a board's end are a subtle sign of growth stress.



Splits appear in board ends where growth stress overcomes the interwoven wood fibers. The wood near the splits will likely warp further.

Drying stress



Kiln drying schedule produced beautiful 4/4 oak, but proved too intense for this 16/4 beam. The results; severe checking.

Drying nearly always introduces some amount of stress in wood. In the kiln, the fast-drying outside of the board tries to shrink, but the slower-drying core prevents it, creating tension in the wood called case hardening. Most professional kiln operators introduce moisture (usually in the form of steam) toward the end of the drying process to relieve the stress on the outer portion of the wood. Unrelieved case-hardening acts much like growth stress in your shop, warping immediately after cutting, and should be handled the same.

Severe case-hardening results in the fibers of the wood pulling apart, creating gaps called checking, as shown at *right*. Report any checking you encounter to your hardwood dealer. They'll want to know about improper drying, and will likely allow you to return or exchange the affected wood.

Moisture-related instability

Even the most stress-free, perfectly dried wood suffers from movement caused by changes in moisture. As moisture is absorbed or expelled from wood, the cells grow or shrink. Improperly stored wood and poorly designed projects suffer from warping or even breakage due to moisture-induced changes.



These changes happen over time, so give your newly purchased wood a fighting chance. Cut and machine it to rough size as soon as you bring it into the shop, milling both faces evenly to prevent an uneven moisture gradient -- where wood is wetter on one side of the board than the other. Then sticker and stack the wood on raised runners for a few days before you use it.

Also, build your project with movement in mind. Avoid gluing or screwing project parts cross-grained in a manner that restricts movement. Leave space in door stiles for raised panels to expand in higher humidity. And finish all sides of a project part evenly so changes in moisture happen at a consistent rate.

Tips for Working with Wood Figure



Figured wood gives your projects pizzazz. These tips will help you work successfully with this sometimes uncooperative material.

Figured stock brings excitement to woodworking in more ways than one. Wood figure, such as the dramatic, glowing waves of curly maple on the green jewelry box above and the striking beauty spots of bird's-eye maple in the sides of the picture frame and the car's body, can turn a project from ho-hum to hoorah. But this visual excitement comes at a price--the sometimes hair-raising experience of working with unruly material.



The very thing that gives figured wood its beauty--grain that twists and turns its way through a board--makes it demanding to work with.

One of woodworking's basic rules--go with the grain--still applies when jointing or planing figured stock. But it becomes more difficult to follow with figured stock. In the curly maple board left, for instance, the grain in the vicinity of the pen point appears to run to the **left**. Under the ferrule on the pen, however, a fold in the grain lines seems to indicate the opposite grain direction--at least for a short distance.



When surface-planing or jointing figured stock, make your best determination of grain direction. Then, adjust your machine to take a light cut--maybe 1/32" or even 1/64". (Needless to say, the knives must be sharp.) Feed the stock steadily at a moderate speed, then check the results.

If you see a lot of chip-out and torn grain, as in the pieces of stock right, try running the material through the machine in the other direction. A lighter cut might help, too. For final machining, choose the feed direction and depth of cut that gives the cleanest results, and mark your stock so you'll always feed it through the same way.

Sanding figured stock to thickness rather than running it through a surface planer often proves most



effective. Drum surface sanders handle irregular grain with greater aplomb than thickness planers.

The ornery grain of figured wood can make sawing troublesome, too. You'll make your best cuts on figured stock by installing a zero-clearance insert in your tablesaw's throat. And when crosscutting, back the stock with scrapwood to prevent chip-out on the exit side of the cut. You'll want a sharp blade here, too.

A good approach to machining parts from highly figured stock is to cut all parts slightly oversize, then sand or plane them to finished size. A low-angle block plane like the one shown **left** does a great job of planing figured wood.



Keep the figure in sight when finishing your wood

Sand figured wood to about 180 grit. Sanding to finer grits won't bring out the figure any better, and may actually lessen its impact.



Here's a method that produces a beautiful figured surface. First, sand to 120 grit. Then, instead of further sanding, clean up the surface with a cabinet scraper as shown **right**. The scraper's edge, when properly dressed, shaves the wood down to a smooth, glassy surface without tear-out. (We follow this procedure on figured wood and burls in the WOOD® magazine shop.)

When you must stain figured wood, rely on dye stains. While pigment stains can highlight figure, they also can obscure it if applied too thickly. Dye stains accentuate the figure more effectively than pigmented stains, no matter how dark the stain color. Gel stains usually mask the figure.

A clear, film-forming finish, such as varnish or lacquer, enhances the depth of a figured surface. This can give it a more dramatic appearance.

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