

a closer look



Spalted wood

LEARN HOW WOOD AND FUNGI INTERACT—
THEN CREATE YOUR OWN BEAUTIFUL BOARDS

BY SARA ROBINSON

Any product associated with rot and decay is likely to have an image problem. Spalted wood is no exception: You're more likely to find it in your firewood pile than in your local lumberyard.

However, a growing number of woodworkers are looking past the decay and discovering the beauties of spalted wood. These include colors not normally found in wood, contrasting light and dark colors adjacent to each other, and most notably, brown and black lines running through the wood. Unique to spalted wood, these lines can range from one or two running down a board to something resembling contour lines drawn by a drunken mapmaker.

Best of all, like fingerprints, each board of spalted wood is unique. It is this diversity that has drawn me to study spalting academically and to use it as a wood turner. I'll talk about how spalting occurs in the wild and how you can try to re-create this process under controlled conditions at home. Finally, I'll give some tips for working with spalted wood.

A fine line between beauty and decay

Spalting, the coloring or bleaching of wood by fungi, can happen to any kind of wood, but various conditions determine whether the result is a prizewinning specimen or a punky lump. These include the types of fungi that colonize the wood, how long the fungi remain there, the interactions between different types of fungi, and the type of wood itself.

There are three main types of spalting in hardwoods: white rot, pigment

Just for show. Because spalted wood may have lost some strength, it's best for non-load-bearing locations such as floating panels. This cabinet, built by Chris Gochnour, uses book-matched panels of spalted maple.



TYPES OF FUNGI

Turkey tail for fast spalting. *Trametes versicolor*, commonly known as turkey tail, grows on dead hardwood across much of North America. A white-rot fungus, it bleaches the wood quickly, but causes too much decay if not stopped in time.



Pigment fungi color the wood. These color wood pink, blue, green, or orange. Like most pigment fungi, this green *Chlorociboria aeruginascens* grows on the inside of the tree.



A source for black lines. *Dead man's finger* is the apt name for this fungus, which can be found growing on stumps of hardwood trees. It causes the dark lines that are often found on spalted wood.

(commonly referred to as stain), and zone lines. Softwoods generally don't produce usable spalted wood as they are more susceptible to brown rot, which often degrades the wood too quickly for use.

White rot is fast but hard to control—White-rot fungi give spalted wood its white appearance by bleaching the lignin found in the walls of wood cells. However, these fungi also reduce the strength and weight of the wood.

One of the most common white-rot fungi is *Trametes versicolor*. Commonly known as turkey tail, it grows on dead hardwoods in a fan shape in overlapping rows, and has

Spalt your own



Keep the wood damp. To help maintain an even dampness around the boards, pour in and then wet some vermiculite (left). Lay dampened boards in the container and place pieces of fungi in contact with them (center). Then cover the boards with more damp vermiculite and put a loose lid on the container. After six weeks, remove a sample block, clean off the vermiculite, and inspect the amount of spaling (right). Check every two weeks until there is enough.

alternating colored bands of brown, blue, yellow, red, or black. It can be found from July through October in North America. *Trametes versicolor* is an aggressive colonizer, making it fantastic for spalting due to its quick growth, but care should be taken not to let it decay the wood past a usable state.

Pigment fungi can be hard to locate—Blue-stain fungi are the most common types of pigmentation, but there are other fungi that impart vivid hues of pink, green, and orange. Most of these brightly colored fungi are secondary colonizers, meaning they can only spalt wood after another fungus has gone through and taken away some of the wood's natural barriers.

Pigment fungi can be allowed to spalt wood for much longer than white-rot fungi, and not as much care is needed to ensure the continued stability of the wood.

Pigment fungi in the genus *Ceratocystis spp.* don't have an easily recognizable fruiting body, like a mushroom, so often the only way to find them is in fallen timber. If you see wood with blue stain, gather shavings or sawdust for do-it-yourself spalting (see below).

Lines usually need two or more fungi—Thin, winding lines of black, red, and sometimes brown that streak across wood are known as zone lines. They form when one fungus erects a sort of wall to protect its resources, or when two or more fungi antagonize each other.

Xylaria polymorpha (dead man's finger) is probably the most well-known fungus that causes these zone lines. It grows worldwide on decaying hardwood and generally resembles a cluster of black "fingers" growing up out of a stump or log. This fungus can erect zone lines on its own, but also puts them up quickly when another fungus is near.

DIY spalting

Spalting wood is a lot like growing plants. With the right amounts of food, water, and heat, you should end up with good results, but success is by no means guaranteed.

Rather like home cooking, every result is likely to be slightly different.



Nasty to nice. After removing the spalted board from the vermiculite, allow it to air-dry. When ready to work, lightly plane or sand the surface and apply a clear finish to display the spaling.



First, pick your wood. Maple, birch, and beech are ideal, as their pale colors act as a blank canvas. Due to its hardness, maple is especially good because areas that receive too much spalting won't turn as soft as, say, a piece of aspen.

Air-dried wood comes already laden with dormant spores of different fungi, so there is no need to introduce more spores. Kiln-dried wood is more hit-and-miss because steam sterilizing will kill all the spores, but regular kiln-drying may kill only some of them. In either case, to be on the safe side, you'll need to obtain fungal spores, either by collecting them out in the woods or checking your firewood pile for spalted wood. If the piece is too small to make anything out of, you can cut the wood and use the sawdust or shavings for your spalting experiments.

Bag it or bin it—The ideal conditions for spalting are darkness with around 80% humidity and 80°F temperature. To achieve these



conditions, you can place the wood in either a plastic bag (but don't seal it, because the fungi require oxygen) or a plastic storage bin. These bins are not airtight and they come in a variety of sizes. If you use a plastic container, it's advisable to pack some sort of filler around the wood to help prevent moisture loss. Vermiculite, a dry, flaky soil additive available at garden-supply centers, is a relatively clean material.

Finally, break the fungi into small pieces and place them on the wood. The board does not need to be covered completely; however, the more places you stick some spores, especially on the end grain, the quicker the piece will spalt. Place the bin somewhere warm and dark, and wait.

The amount of time it takes for a piece of wood to start spalting will vary by species, fungi, temperature, and the size of the piece. Because moving the wood slows the spalting, it is best to place a few small sample pieces of wood in the container at the start of the experiment. Starting at six weeks, remove a block every two weeks to check it for softness and color. If you like what you have, remove the board from the bin or bag. If not, wait another two weeks and check again.

Once you remove the spalted wood from its container, make sure to air-dry it before use (unless you will be turning it that day). The fungi will continue to colonize the wood until the moisture content drops below 20%.

Working with spalted wood

There is a misconception among many woodworkers that working with spalted wood is particularly dangerous. Most fungal spores are about as harmful to a healthy adult as

Turning spalted wood

Turning is a great way to display spalted wood. You can turn dried blanks, but green wood has a more consistent density.



Reinforce soft areas. Wood that has been softened by fungi can be hardened by soaking it with cyanoacrylate ("Super") glue. The glue won't show after a finish has been applied.



Controlled sanding. Some sections of spalted wood are softer than others, so it is better to use foam sanding pads on a drill press rather than sanding the work while it is on the lathe.

wood dust, so if you sand spalted wood, wear a mask. However, people with immune system disorders should *not* work with spalted wood.

Because areas of heavy white rot are likely to be softer than regular wood, when handplaning, use a low-angle blade to slice through the wood. When turning, pockets of rot can cause dig-ins and uneven sanding in the final product. If areas of the wood are spongy, or if there are small splotches of white throughout the piece, you might want to stabilize those areas with a two-part, five-minute epoxy resin or cyanoacrylate glue.

It's a good idea to turn spalted wood when it is green because the whole piece is soft, which minimizes the difference in hardness between spalted and unspalted areas. Because the grain rises as the wood dries, sanding is most efficient after the wood has dried.

Finally, softer areas of spalted wood will soak up finish, so it may take several extra coats before the cells become saturated. While you'll probably spend a bit more time shaping and finishing spalted wood than traditional lumber, the end results are well worth it. □



Full of character. The left-hand bowl is silver maple spalted with blue stain and two types of white rot. The other bowl is box elder, but the pink streaks in this case are caused by spalting.

