

Blackening Wood – on Accident ... on Purpose (Related discussion on blackening metal included)

Text by William Johnston

At a recent Woodworkers' Guild meeting a comment was made that it was desirable to place a barrier (wax paper, for example) between a bar clamp and the wood to be glued and clamped to prevent the wood from blackening on contact with the metal bar clamp. Wood blackening can occur by accident, causing additional finishing work, or on purpose with interesting and often elegant results.

On Accident ...

Everyone has seen an oak slat fence, naturally brown with age, marked with black around and streaming down from every nail. What causes this?

Three components are needed to blacken wood ... tannic acid, iron, and water. Some woods naturally contain tannic acid. Cypress trees in Florida swamps literally ooze tannic acid and seasonally turn the water Coca-Cola brown. Both oak and walnut, and to a lesser extent Cherry, also contain tannic acid. Maple and most light colored woods do not. When this natural occurring tannic acid comes in contact with water and iron, a black die is formed which blackens the wood.

Blackening can happen by accident in your shop when a tannic acid containing wood comes into contact with the water in wood glue, for example, and the metal clamp pipe. It can also happen when you create small metal filings while grinding at the wheel or sharpening metal. If you happen to allow these filings to contact tannic acid woods and then wipe with water the area will turn black.

So to avoid accidentally turning wood black keep your wood away from iron or iron dust and water.

On Purpose ...

Both oak and walnut look great blackened. Walnut, more so due to the grain, can be easily made to resemble ebony. So how do we begin and control this blackening?

Start with the equivalent of a quart Mason jar with a lid. Put an inch (more or less) of vinegar in the jar. Add half of a steel wool pad. Do not use Brillo or a pad containing soap. Fill the jar half full with water and shake the mixture. Cap and wait about 3 days. Do not expect a color change. It is the clear liquid we want, not the iron settlement at the bottom.

With a sample piece of Oak or Walnut in an isolated area away from your unfinished wood storage, wipe the wood with a cloth or steel wool pad that has been dipped into your prepared solution. Almost instantly, the solution will begin reacting with the tannic acid in the wood and you will begin to see a change color. The more you apply the ultimate deeper the color.

How can you use this method for blackening tannic acid containing wood?

Start with the prepared solution and the wood. Since you are wetting the wood and raising the grain, you may want to wet the wood first, raise the grain, lightly sand down the grain, and repeat several times until you are satisfied that the grain will rise no more. As an alternative, you can blacken the wood with the solution, lightly sand, and repeat. The blackening does not go very deep (exception: when you're trying to get the black off of the wood blackened by accident). So prepare the wood so that you do not have to sand or scrape after the last application. When the black is as deep as you wish, let the wood dry. Finish as normal. Penetrating finishes work very well.

How can you blacken wood that is not natural in tannic acid?

If you want a deeper black on wood that is light in tannic acid (cherry, for example) or want to blacken wood with no tannic acid, add a single tea bag to the solution described above. Tea contains the tannic acid you need. This solution will turn black. Proceed as above as if the wood contained natural tannic acid. Experiment, as different woods blacken easier and deeper than others depending chiefly on the solution absorption.

Blackening Metal

A few words about blackening metal while we are on the subject, although the process is entirely different. Industry has developed numerous ways of blackening, bluing, and pickling metal, each for a different purpose ... appearance, rust prevention (doesn't work), glare reduction, surface preparation, and others.

Burchwood Casey is the major developer of consumer and industrial blackening solutions for metal. Their chief consumer market is for gun finishing. Essentially the Burchwood Casey solution produces a "black oxide" finish on steel. They have other products for brass and aluminum that work somewhat similarly. Burchwood Casey products can be found at machine shop supply stores and catalogues, as well as gun shops including most hunting and fishing retailers.

This "black oxide" is essentially a variation of rust. However, unlike iron oxide (rust) this oxide does not continue to consume the metal after initial application. However, note that the metal will rust (red oxide) if exposed to the right conditions ... moisture and salts. Black oxide forms extremely small pits in the metal. These pits will fill with applied oil and 'help' prevent rust. As one manufacturer of black oxide parts noted, "it will prevent rust, at least until the consumer has installed the product."

So why would a woodworker want to know this ...

You may want to blacken certain tools and hardware. Often the plain hardware appearance is improved by blackening.

Have you ever noticed that antique tools with brass applications use steel screws instead of brass screws? Of course, this is because brass screw heads can be easily damaged and brass screws can easily twist off where the stub is hard to remove. While there are a number of solutions including drilling proper sized holes and inserting and removing steel screws prior to installing brass, you may want to use blackened steel screws instead.

Blackened steel screws, especially with brass hardware, and blackened steel hardware have, in many cases, a nicer appearance. Blackened woodworking tools, like guns and sights, have reduced glare. Older metal tools, where rust has been removed, and the metal polished, may look better to you after blackening. A light coat of oil on a blackened surface will help it resist rust better than on an unblackened surface.

First remove anything from the iron (steel) hardware that is to be blackened. I mean anything ... coatings, finishes, oil, finger prints. Zinc coatings can be removed with a wire brush. Polish the iron as any blemish will show up. Next clean with mineral spirits and last wash with soap and water. I have sometimes used a weak sodium hydroxide (lye, as in drain cleaner) solution but this causes other potential dangers and needed care. Soap and water as a final cleaning works about as well. You do not need to purchase any special cleaner, although cleaners are sold. Keep your hands or anything oily off of the clean metal. Make sure any soap has been rinsed off. There is no compelling need to dry the metal but excess water dilutes the black oxide solution.

Apply the black oxide solution with a paper towel, cotton swab, steel wool or any suitable, absorbent material. The finish will immediately turn black and continue to darken within a few minutes or with repeated applications can be darkened to the desired depth. When the desired depth is reached wash the metal in water, dry with paper towel, and let thoroughly dry. I sometimes use a hair dryer. Remember to dry areas inside tubes and recesses. Apply oil to the metal. I especially like synthetic motor oil that I wipe on and back off. Synthetic motor oil has a dryer, waxy feel as compared to other oils.

For more information on tannic acid see: http://en.wikipedia.org/wiki/Tannic_acid
For more information on black oxide see: http://en.wikipedia.org/wiki/Black_oxide#Uses or
<http://www.epi.com/black-oxide/blackoxide-faq.htm>

Questions, comments, and corrections are welcome and may be directed to:

William Johnston
johnston@everestkc.net
913-492-6942