

Water-soluble powdered dyes are by far the easiest to use, offer the widest selection of colors and are the most color fast ...

Working with Water-Soluble Dye



The instructions accompanying most powdered water-soluble dyes direct the user to dissolve the contents of the dye container in one-quart of water. That's fine if the resulting mixture will produce the color and shade (intensity of color) that the finisher wants. But what if the objective is a color that is a bit lighter or darker, or if we need to adjust the color to achieve a better match. One of the primary attributes of water-soluble dyes is that they offer the finisher far more flexibility than is available with pigment stains. However, much of this flexibility is lost when the finisher complies with these instructions. The one-ounce in one-quart instruction produces the manufacturer's concept of how the dye should look. If the color isn't dark enough the finisher's only option is to purchase and mix more dye in a higher concentration.

We also frequently recommend mixing two or more dye colors to achieve a color match or to accomplish a color objective. In order to do that the finisher must have an inventory of dye colors on hand from which color samples can be mixed. Certainly, we could have a collection of quart containers, each holding a different dye color. But it is much easier to store smaller containers of dye concentrate than to store the same number of containers at the manufacturer's recommended concentration. After some experimentation we determined that dyes mixed greater than twice the recommended concentration are rarely necessary. At the same time, we frequently use dye concentrations stronger than the manufacturer's recommendation. We also determined that the 16-ounce squeeze bottle sold by many retailers is easy to store and easy to hold. Therefore, we have settled on mixing our dye concentrates by dissolving one-ounce of dye powder in 16-ounces of distilled water.

To mix our dye concentrate we heat 14-ounces of distilled water in our microwave. I prefer a glass one-quart microwave safe mixing cup with a pour spout. The water need not boil;

heating to the temperature of hot coffee will be sufficient. Next, slowly one-ounce of powdered dye to the hot water, stirring constantly. After the dye is added and thoroughly mixed carefully pour the mixture into a 16-ounce container. There will likely be a small amount of undissolved dye remaining in the mixing container. Add a "splash" of distilled water to the mixing container to pick-up any remaining undissolved dye and pour this into the 16-ounce container as well. Finally, top off the 16-ounce container with distilled water and allow the dye concentrate to cool to room temperature before use.

Now, armed with a set of measuring spoons, a few empty yogurt cups and some cut-up synthetic kitchen sponges we will proceed through the process of using our dye concentrates to determining the composition and concentration of our working mixture. The example we will use is the process we followed in restoring the natural color to steamed walnut in our article "[Put the Life Back in Steamed Walnut](#)".

When we began, we didn't know what our final working mixture would be, but we were able to determine that the primary dye color would be our Standard Brown Walnut based on color samples applied to 4" square color chips made from 1/8" Baltic birch. By applying a standard concentration sample to a scrap of steamed walnut we knew that the final working mixture would have to be very weak (highly diluted) since the wood we were coloring was already dark; we are only trying to restore the natural color, we are not trying to make a light color species like soft maple look like walnut. We also knew that we would need to adjust the dye color by adding red and purple tones. But the amount of the dilution and the selection and volume of other colors would have to be determined by testing.

The first step, then, was to determine how much we would have to dilute the Standard Brown Walnut to keep the brown color of the dye from adding too much color to the muted gray/brown of the steamed walnut. After multiple test mixtures we determined that a dilution in the range of one-part dye concentrate to 24-parts distilled water would be a good place to start. At this dilution, the color is the same that we would have achieved had we mixed one-ounce of powdered water-soluble dye with 13-quarts of distilled water; this will be a very diluted mixture. We also knew that when we added color to achieve the reddish/purple over tones we wanted this dilution would have to be adjusted. But it was a starting point.

Important: After each test we dump the original mixture and prepare a new mixture. It is especially important to begin new mixtures and not attempt to adjust mixtures from which

we have already drawn dye samples. Once liquid dye is removed from a sample it is impossible to determine an accurate mix as either new colors or more water are added.)

In the next step we begin to adjust the color of our working mix by adding red; but which red. Bright Red or Crimson Red are both too red. Rosewood gave us our mixture the reddish brown that we needed. In our first attempt we mixed one-part Standard Brown Walnut and one-part Rosewood and diluting the mixture with 24-parts distilled water. This mixture was still much too red, so we made another test mix of 3-parts Standard Brown Walnut and one-part Rosewood, again diluted with 24-parts distilled water. This mixture gave us much better color intensity but lacked the purples & cordovan colors we wanted. The logical next step, the addition of blue which combined with the red would give us purple, led to our final dye mixture; 3-parts Standard Brown Walnut, 1-part Rosewood and 1-part Navy Blue. However, the previous dilution of 24-parts distilled water resulted in a color that was too dark. When we increased the dilution to 30-parts distilled water the working mixture gave us the color we wanted.

Once the color ratios and the dilution factor are determined it becomes a simple matter of increasing the volume of the parts to produce the amount of dye necessary for your project.

Applying Dye Test Samples

Dyes color best when the wood being colored is flooded with dye so that the cell structure of the wood can absorb all of the color it wants. Testing your working mixture should also be done by flooding the surface of the sample. We prefer using synthetic kitchen sponges in both applications. The only difference is that in the testing phase we use small pieces of sponge.

We fill the small sponge with dye and apply it liberally to our sample. We then wring the remaining dye from the sponge and use the same sponge to pick-up the unabsorbed dye. The color you see while the dye is still wet offers an accurate representation of the color you will see beneath a coat of clear finish. As the dye dries it will become much lighter and when dry it will not accurately represent the color you will see when the finish is applied.