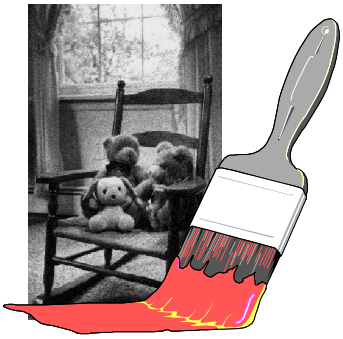

Wood Finishing & Refinishing

Fact Sheet #7

Sealing, Staining, and Filling

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Many people today find satisfaction in building or reworking furniture for their homes. Using proper methods of sealing and staining can transform some of these wood furniture pieces into beautiful items. Knowing ahead of time what you want your wood furniture piece to look like can help you achieve the desired effect.

Sealers

In the wood refinishing process, sealers are used for several purposes: to reduce the quantity of stain absorbed into bare soft or hard wood; to prevent a knot hole from gum-bleeding into the top finish; and to produce more even staining. Sealers also are used on certain areas of wood furniture that tend to absorb too much stain, such as the edges.

Sealers are also applied over the stain and filler to prevent bleeding of the stain and filler into top finishes. Most stains made today are self-sealing. Therefore, they do not need a sealer. Self-sealing finishes include the synthetic varnishes such as vinyl, acrylic, epoxy, urethane, and the penetrating finishes.

Before using any sealers on bare wood, the wood surface should be properly sanded starting with 100 grit sandpaper and working up to 180 or 220 grit sandpaper. The wood surface should also be wiped with a dry cloth and a tack rag before the sealer is put onto it. Sealers can be divided into two groups. They are the do-it-yourself sealers and the sealers you can buy.

Do-It-Yourself Sealers

Sealers come in two types: 1) sealers used to stop bleeding of stains (not a problem today) into top finishes or to reduce absorption of stain on end grain, and 2) sealers used to seal wood pores, so they can be easily sanded. These are commonly referred to as sanding sealers.

One method of sealing a wood surface is to apply, with an old nylon, a mixture consisting of three parts gum turpentine to one part boiled linseed oil. Immediately wipe off the excess mixture, then let dry 24 hours before staining. DO NOT SAND before staining.

Some refinishing experts suggest that when choosing a sealer, it's a good idea to use the same materials that you're going to use for the transparent topcoat. The only difference between the topcoat and sealer is that the sealer is not left on as long and has been greatly thinned with the solvent suggested for thinning on the can label. Vary the strength of the sealer according to how much of the stain you want to penetrate into the wood.

For example, if you're going to use a varnish, mix one part of varnish to one part of turpentine. Wipe it on and then immediately wipe it off. Let it dry and then stain lightly.

If you're going to use a clear tung oil finish, you can partially seal the wood surface by applying a thin coat of tung oil finish (full strength) with a cloth. Immediately wipe off all excess tung oil from the wood surface. Let it dry 24 hours and then apply the stain.

The best sealer is shellac, but it is seldom used.

Sanding sealers can be purchased in paint or hardware stores. It is very important to check the label on the can to be sure the sealer is compatible with the finish you plan to use. Follow label instructions.

Fillers

Before staining open-grained woods, you need to decide whether or not you're going to fill the pores when you stain. Wood fillers are used to fill open grained woods such as oak, walnut, and mahogany. Wood fillers give wood surfaces a smooth, flat surface without any open areas that would collect dust.

Wood refinishing experts often disagree on the use of wood fillers. Some feel it is a necessary step in refinishing; others believe it gives the finish a flat look. The trend today is away from filling open-grained woods.

In general, only new unfinished open pore wood needs filling. Most likely, old pieces of furniture have already been filled, but refinishing may remove some or all of the original filler. To determine if you need to use a wood filler, draw your fingernail across the wood grain. If your fingernail catches in many spots, a filler may be needed if you wish to achieve a flat appearance.

The most common type of filler is made into a paste. Paste fillers usually have a thick consistency that must be thinned before use if you're going to apply the filler without first mixing the stain into it. Paste fillers can be thinned with paint thinner. If you're going to apply the filler and the stain together, the stain will be the thinner. The wood filler can be mixed with the desired stain so the staining and filling can be done in one operation. Some paint and hardware dealers sell a type of ready-mixed filler stain for just this purpose. The following steps are suggested for mixing and applying a paste wood filler and a stain.

1. Stir the paste wood filler in its container until it is smooth.
2. Do not thin with turpentine because the stain will serve as the thinning agent and thin the paste filler to the right consistency.
3. Mix 1½ cups of paste wood filler to 1 cup of oil-based stain.
4. Stir well before using. Apply filler and stain generously with a short bristle, stiff brush. Pack the filler into the wood pores by applying filler first with the grain and then across the grain. (See Figure 1, Packing Filler into Wood Pores.)
5. Allow it to dry until the surface looks dull. This will take 10 to 15 minutes. To test, drag your finger across the surface. If a ball is formed, it's time to wipe off the

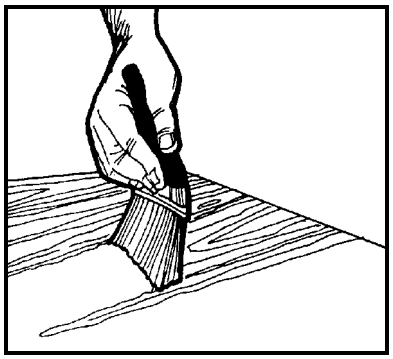

Figure 1. Packing Filler Into Wood Pores

excess. If the filler and stain slip under pressure, it's not dry enough to wipe.

- 6. When the surface is ready, wipe across the wood grain with a piece of nylon. (See Figure 2, Wiping Across Grain.)
- 7. Finally, lightly wipe the wood surface in the direction of the grain.
- 8. Let the finish dry 24 hours. The filler and stain can be applied two or three times to make a perfectly smooth surface.

NOTE: If the filler and stain dry too fast and are difficult to remove, wipe off with coarse steel wool dipped in paint thinner.

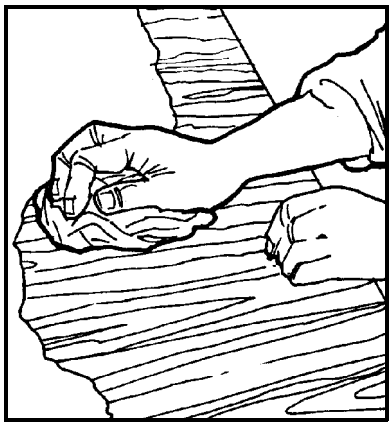

Figure 2. Wiping Across Grain

Stains

After you have decided whether or not to seal the wood and whether or not you're going to use a filler, you are ready to stain. A good stain can (1) enhance the natural beauty of the wood; (2) add color and character to the wood; (3) make one wood type look like another; and (4) color different woods to look similar to each other.

To decide if you need to stain your wood, moisten a spot with water or mineral spirits and check the color. The moist spot is what the wood will look like with only a finisher added.

When you walk into a paint or hardware store to purchase a wood stain, you will be amazed at the many kinds of stains that exist. All of these stains fall into three general categories. They are: (1) pigmented oil stains or wiping stains; (2) penetrating oil stains; and (3) water-based stains.

Pigmented Oil Stains

Pigmented oil stains are made from color pigments, similar to those used in coloring oil paints, mixed with a variety of solvents. Because pigmented stains are opaque, they tend to cloud or conceal the wood grain pattern more completely than other wood stains such as dye stains.

The pigmented oil stain is probably the most popular staining product used for wood refinishing because it is easy to apply. These pre-mixed stains can be purchased at the paint or hardware store under such names as oil stains, wiping stains, wood stains, and pigmented stains.

Pigmented oil stains are more effective on some types of wood than others. Hardwoods, especially of closed pore structure, will absorb less pigmented stain than softwoods. In some cases, the pigmented stains may not stain the closed pore hardwoods sufficiently. Open pore hardwoods such as oak, mahogany, and walnut take a pigmented stain quite well.

Since softwoods such as pine, fir, and poplar absorb the pigmented stain sufficiently into the wood, pigmented stains area recommended for softwoods. Due to the hint of pigment, they cover up the wood underneath.

Pigmented stains are very easy to make from scratch. This knowledge comes in handy when you try to match another wood color or when you want a certain wood color you can't

buy in the store. To make your own pigmented stain from scratch:

- 1. Select artists oil colors (the ones in the tubes). Use the chart on the following page to determine which oil colors you should purchase.
- 2. You will also need to prepare the base mixture consisting of:
  - 2 parts boiled linseed oil
  - 2 parts gum turpentine
  - ½ part Japan drier

  NOTE: Depending on the size and number of pieces to be stained, you will need from 1 tablespoon to 1 cup of the base mixture.
- 3. Squeeze the appropriate artist oils into the base mixture. Note how many inches of the particular artists oil you put into the container so you can duplicate the color if you want to.
- 4. Mix thoroughly. This will take a little time.
- 5. Pretest stain on underside of wood furniture piece until you achieve desired tone. If the color is too dark, add turpentine to lighten the color. Once you get the right color, record for future use the amount of artist oils you used to get that color.
- 6. Wipe the surface with a tack rag. Then apply the stain with a lint-free cloth (nylon).
- 7. Wipe off excess stain before it has time to completely dry. The longer the soil stain is left on the wood, the deeper it will be absorbed.
- 8. Allow it to dry for 24 hours.
- 9. Wipe with a tack rag and proceed to top finishes.

Penetrating Oil Stains

Penetrating oil stains consist of oil soluble dyes, not pigments, dissolved in a synthetic or natural oil-based liquid that penetrates into the wood fibers. The difference between a penetrating stain and a pigmented stain is that the penetrating stain actually penetrates into the wood and allows more of the wood grain to show through, whereas the pigmented stain is more opaque and clouds and coats the wood surface. The way to tell the difference is to look on the label of the can. The label will often say “penetrating” on the front label or on the back label. The directions will indicate that you should let the stain penetrate into the wood and then wipe off the excess.

If you are going to use the combination penetrating stain and finish on softwood, make sure the piece of wood has a beautiful grain because the wood will show through the finish. Penetrating stains and finishes work nicely on hardwoods because of their beautiful grains. Read the label application instructions to determine the correct method for applying combination penetrating stains and finishes to your wood surface.

Water-Based Stains

Water-based stains give the clearest and most transparent results of all stains. They are inexpensive and the colors are clear, brilliant, and permanent. Water stains are available in paint and hardware stores. Check the label to see if it is a water stain. If the directions indicate that you should use water to clean up, it’s a water stain. Water stains can also be purchased in a powdered form from mail order catalogs. The powder is mixed with water or alcohol.

Use a water stain only on new wood, never on wood that has previously been stained and finished. On previously finished surfaces, you can expect uneven and blotchy stain penetration when using water stains. Water stains are effective when used on woods such as cherry or walnut that require only a slight boost in color to look more beautiful. Water stains

let the wood grain show through the finish. Therefore, before using on a softwood, evaluate whether you want the grain to show through.

You can't have all of the advantages of a water stain without a few disadvantages as well. **Water stains swell the wood fibers and raise the wood grain.**

To apply water stains, use the following procedures:

1. To minimize raising of the wood grain and for more even staining, presponge the area to be stained with warm water. Let it dry and then sand.
2. Pretest the dye on a piece of scrap wood, preferably wood of the same type as your furniture piece.
3. Sponge on the water-based stain. Do not overlap strokes or allow drops of water to stain the wood.
4. If darker spots appear, sponge with clear water immediately and wipe off as much stain as possible.
5. After the wood is dry, the color may be made more uniform by sanding the dark spots to remove some of the stain. Add additional coats of stain until the desired color is obtained. Let it dry for 24 hours.
6. If recommended on the stain label, apply sealer coat to avoid the stain bleeding into the surface finish.

Table 1. Artist's Oil Colors for Mixing Woodstain

CHERRY—light 2 parts raw sienna 3 parts burnt sienna	**CHERRY** Burnt sienna	**MAHOGANY**—brown 3 parts burnt sienna 1 part rose rink or maroon lake 1 part Vandyke brown
MAPLE—Reddish honey tone 1 part burnt sienna 1 part burnt umber	**MAPLE** Burnt umber	**MAHOGANY** — red 3 parts burnt sienna 2 parts rose pink ½ part burnt umber
DARK OAK 1 part burnt umber 4 parts raw sienna	**LIGHT OAK** 4 parts raw sienna 1 part raw umber (to dull)	**WALNUT**—rich dark brown 4 parts burnt umber 1 part Vandyke brown
WALNUT—rich reddish brown 4 parts burnt umber ½ part burnt sienna	**WALNUT**—Yellowish brown 3 parts burnt umber 2 parts raw umber	

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