Furniture Refinishing for the Beginner

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FURNITURE REFINISHING FOR THE BEGINNER

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Antique furniture refinishing is generating much interest. Some families are furnishing their homes with
refinished furniture rather than purchasing newer,
more expensive items which are sometimes con-
structed of lower quality material. Still other families
are content to restore an heirloom or two.

The information in this bulletin will help the novice
select the best and easiest method of restoring furni-
ture commonly found at reasonable prices in antique
shops and secondhand stores. It is assumed that the
piece will be restored using a natural finish.

To restore period pieces of furniture such as He-
pplewhite, Chippendale or other furniture of museum
quality, retain as much of the original finish and patina
as possible. If you have a valuable piece of furniture, it
is better to consult a professional furniture refinisher
about cleaning and restoration methods.

STRIPPING:
DO-IT-YOURSELF

Supplies: Paint and varnish remover, synthetic
bristle brush, natural bristle brush, scraper, rags,
"0000" steel wool, lined neoprene gloves, shellac,
denatured alcohol, soft brass bristle brush.

The first step in furniture restoration is the re-
moval of the old finish. There are several methods and
deciding which one is best requires a basic under-
standing of the principles involved. Let’s look at some
of these possibilities.

First, when refinishing furniture, certain chemicals
may react with metal hardware. Therefore, remove all
metal hardware such as drawer pulls, escutcheons
and hinges before beginning. This also provides large
flat areas on which it is easy to work. Remove doors
and other large flat surfaces and lay flat to provide
easier working conditions.

Refinishing is best done outside on warm days
(70°-90° F). Direct sunlight causes rapid drying of the
remover and should be avoided. If the refinishing must
be done inside, be sure to work with ample ventilation.

Most removers harm floors and other surfaces, so
be sure to protect them. Protective clothing should be
worn.

Multi-coat clear finishes
Furniture with clear finishes have been finished with
shellac, varnish, lacquer or a combination of all three.
Through the years dust and grime may have accumu-
lated and more coats of clear finish may have been ad-
ded. The result is a dark-looking finish in which the
natural wood color and grain are no longer visible.

If this is the case, use one of the many commercial
paint and varnish removers. These removers can be
purchased in various quantities and brands in almost
any paint, hardware or discount store. Most commer-
cial removers are liquid. Liquids tend to run and if
allowed to remain on a cleaned wood surface may
cause streaking. Therefore, it is important to keep
surfaces in a horizontal position and to use small
quantities of the remover. If the remover is spilled on
clean surfaces, wipe it up immediately.

Apply the remover with a synthetic bristle brush
(nylon or polyester, for example) which has not been
used for painting. (Any paint residues left in the brush
may be deposited in the wood pores and leave an unsightly
surface.) Apply the remover in liberal amounts
to small areas at a time. Keep the surface wet until the
old finish is softened and begins to “blister.” Then
wipe clean with old rags or steel wool and either min-
eral spirits or water depending on the label directions.
Several applications may be needed, depending on
the old finish. Do not spot treat areas you missed the
first time but recoat the entire section to avoid streak-
ing. Use a toothbrush to remove the finish and re-
moover from recessed areas. If you have to use a putty
knife or paint scraper be careful not to gouge the
wood.

Some commercial removers contain wax. If this
kind is used, wipe the stripped wood surface with al-
cohol or benzine to remove any trace of wax which
may prevent the new finish from drying properly.
However, if the surface is to be sanded or otherwise worked before finishing, this step can sometimes be eliminated. Until you have gained experience, it is always best to follow the manufacturer’s directions.

Shellac finishes
Shellac is one of the earliest finishes. Its natural solvent is alcohol. A shellac finish can be removed easily with denatured alcohol and steel wool or rags. Of course, commercial removers are equally effective.

Some older pieces of furniture have shellac finishes which have checked or turned powdery. If these finishes are thin and not built up from several coats, they can be made to appear like new. Brush on denatured alcohol and, when the finish is dissolved, stroke in the grain direction and allow to dry. This method saves the time and expense of sanding and application of a new finish. Of course, if you wish to stain, bleach, etc., the entire finish must be removed. If the finish is particularly thick and begins to “ball up,” use a solution of one part lacquer thinner to four parts of denatured or wood alcohol.

Lacquer finishes
Lacquer finishes were first used about 1920 and have remained popular. They may be treated as shellac finishes except use lacquer thinner as the solvent.

Paint finishes
Furniture finished with paint presents a more complicated problem, especially when multiple coats are encountered. To make the job easier, use a semi-paste remover; brush on, using a heavy coat of remover on the painted surface. Allow the remover to work on heavily painted surfaces for a minimum of four hours. Then, brush a thin coat of remover over the first coat of remover to soften it. Wait a few minutes and remove according to label directions. If any paint remains in the grain, apply another coat of remover and scrub with a soft brass bristle brush (e.g. suede brush) dipped in water. Always scrub with the grain.

On some painted surfaces an initial scraping is helpful. A sharp paint scraper will remove many coats of paint and thus prevent the material from becoming lodged in the wood pores. Where the paint is old and brittle or beginning to peel, scraping is particularly easy and is recommended. In other cases, scraping is more difficult and total chemical removal is desired.

Always scrape with the grain and be careful not to cut or gouge the wood.

One of the major problems with painted furniture is that the paint becomes lodged in cracks and carvings. If care is not exercised, paint can be pressed into the grain during stripping. If a clear finish or sealer has not been applied to open grained woods such as walnut, oak or mahogany prior to painting or if this original finish has been worn away, the paint may be embedded in the wood pores. Close grain woods such as cherry, maple and yellow poplar do not accept paint as easily. The trick is to remove any paint before the original clear finish is softened. One method is to first scrape the paint as previously described. If a chemical remover is being used, try to remove the paint as soon as it is softened and before the original clear finish begins to soften. It is sometimes helpful to remove the paint with a putty knife rather than rubbing it loose with a brush or rags because rubbing tends to force the paint down into the wood pores.

If paint becomes embedded in the pores of the wood or in end-grain surfaces, it is sometimes impossible to remove with home paint removers. Commercial stripping operations may be necessary. If this happens, apply shellac to the stripped surface. Allow it to dry. Then repeat the stripping procedure. Sometimes the paint adheres to the shellac and is removed from the pores. If the paint cannot be removed, it can be covered with tinting pigments such as burnt umber, yellow ochre, or burnt sienna. Your local paint store should have a supply of these.

Milk-base paints were used on some very old country-type furniture. The milk acts like a glue and, as a result, most removers will not cut it. Full strength household ammonia applied for 5 to 10 minutes and a steel wool scrubbing pad are recommended. After all paint is removed, rinse the surface with clear water and use a saturated solution of oxalic acid crystals and water to bleach the wood to its natural color. (See Bleaching, page 4.)

STRIPPING: COMMERCIAL

Commercial strippers fall into two general categories. One type is the skilled craftsman who uses his experience and special techniques to produce a first class job. He almost always removes any finish very carefully and by hand, usually with petroleum-based chemicals. Dip tanks to salvage any runoff chemical may be involved. Also, he will prepare the surface and apply the finish. Because of the skill and time involved, these craftsmen usually work on the finer and more expensive furniture.

The second type of commercial stripping operation almost always dips the furniture into large tanks of caustic chemicals. Most of these operations leave the sanding and finishing up to you.

The major problem with the dip-type operation is that water-based caustic chemicals are used which decompose wood as well as paint. Therefore, extreme care must be exercised. During the stripping process, the wood is bleached, grain raised, and glue joints are often loosened. Therefore, avoid taking veneered, inlaid or high quality furniture to these firms.

Badly abused furniture, with many turnings and uneven surfaces or with many coats of paint, is often difficult to strip at home. Because of the clean job that results, it may be advisable to have these difficult pieces stripped commercially. Also, the commercial
operations are more likely to remove paint which has become embedded in the pores of the wood than do-it-yourself removal. The color can be brought back to the wood and the raised grain sanded, and a satisfactory job of refinishing will result.

SURFACE PREPARATION

Supplies: “000” and “0000” steel wool, tack rag, very fine and extremely fine sandpaper, and stain. Optional: bleach, electric sander, and wood filler.

After stripping and before finishing, most wood surfaces need some type of preparation. Some will need only a good rubbing with extremely fine steel wool while others will need a careful sanding. Many woods have a characteristic beauty and natural color which should not be destroyed by bleach or stain. However, in cases where the wood has been badly abused or if you desire a different color, considerable bleaching or staining may be necessary.

Sanding

On finer pieces of furniture which have not been badly treated, a fairly smooth surface may still remain after stripping. A good rubbing with the grain, using “000” or finer steel wool, will be adequate before staining or finishing. Use a tack rag and be certain that all the steel wool particles are removed before proceeding.

Some furniture is veneered and care must be exercised not to sand through the very thin surface. A very light rubbing with “0000” steel wool will be adequate before staining or finishing.

Furniture has often been abused, at least in part, or it wouldn’t need refinishing. In most cases, only a light sanding with “very fine” and “extremely fine” grades of sandpaper is needed. Sanding removes raised grain and smooths out rough spots. It also helps remove old finish or wax that is left behind by the stripping process. On badly abused surfaces, heavy sanding—beginning with coarse or medium-grade paper and advancing to a very fine grade—is necessary to prepare an acceptable surface. Check for smoothness by wiping the surface with an old nylon stocking. If it snags, you need more sanding.

When sanding, always stroke with the grain rather than across it. Keep dust removed from the sandpaper grit. If the wood still has some finish or wax on it, “clogging” of the sandpaper will occur. “Clogged” sandpaper may be scraped or brushed to extend its use.

Do not sand antiques extensively except where the piece has been abused. Sanding may remove the patina—the characteristic mellow, soft look which comes only with age. Because it is easier, there is a tendency to sand more on the large flat surfaces than on turnings or carvings. The result may be light colored flat surfaces and darker turnings and carvings.

Sandpaper

Finishing grades of sandpaper, fine and very fine, are available in three types:

- **Flint paper**, the most common type, is made of quartz or silica and has a yellow cast. Flint paper is the cheapest material but wears fast and cuts slowly.
- **Garnet paper** is made of garnet and has a tawny red cast. Garnet paper is intermediate in price and quality.
- **Wet-or-dry, aluminum oxide paper**, is electrically coated with a metallic oxide and has a grayish-brown color. Aluminum oxide is the most expensive paper but also lasts longer and cuts faster.

Sandpaper comes in 9 by 11 inch sheets and should be cut into four equal parts before use. A wood sanding block about 3 by 5 inches, padded on one side with rags, foam rubber, etc., will help hold the paper and keep it flat. The padded block also cushions the paper against the wood and prevents gouging.

Electric sanders

Unidirectional sanders are helpful on some jobs that require extensive sanding. Oscillating sanders leave little circles on the harder woods; belt sanders are difficult to control when doing fine work. The ideal sander is a plate type that can be set to oscillate for rough sanding and then changed to a back and forth action for finishing. Use open-coat aluminum oxide paper because of its long lasting qualities.

Steel wool

Available in several grades and packed into pads, the courser grades are denoted by numbers like 1, 2, 3, and are not practical for surface preparation. The fine grades such as “000” and “0000” are most often used in furniture finishing. Steel wool which has been treated with soap should not be used.

Bleaches

Naturally dark woods or those which have been stained dark can be lightened by treating with laundry bleach. Dark stains caused by water or various chemicals over the years can also be removed in this manner.

To bleach any wood, make sure the surface is clean of dust, glue spots, finish or any dirt. Apply the bleach evenly with a brush or soft rags over the entire surface. Allow about a week for the wood to dry. It is a good idea to test the bleach on small scraps of wood or on inconspicuous areas before starting. Bleaching usually raises the wood grain; additional sanding will be necessary.

Commercial bleaches are available in paint and hardware stores. They usually come in two parts and are used to bleach the natural color out of wood. Directions are available with the material but, generally, the first part is applied followed by the second. The
process is repeated as many times as necessary to obtain the desired color.

Oxalic acid makes an effective bleach. Dissolve 1 to 4 ounces of oxalic acid crystals in one quart of hot water. This should produce a saturated solution. Apply the solution evenly with a brush or cloth. Allow it to dry for five minutes and continue to apply until the desired color is obtained. After the final coat, rinse the surface well with clear water until all traces of crystals are removed. Allow ample time for the wood to dry before sanding and finishing. Oxalic acid is also effective in removing black watermarks from wood.

Caution

Oxalic acid is poisonous and the crystals are irritating to mucous membranes. So exercise proper precautions.

When using either commercial wood bleach or oxalic acid wear glasses or goggles, lined neoprene gloves and have a bucket of water handy to flush off any bleach you might have splashed on your skin.

Wood fillers

This is an optional process. These are used to fill the pores of open grain woods such as ash, mahogany, oak and walnut. The result is an extremely smooth surface. Apply the filler after sanding but before staining and finishing. Paste filler comes in different colors. It is best to use a natural color and tint it yourself. The filler can be thinned and tinted with the stain at the same time.

Natural paste filler should be thinned at the rate of 5 teaspoons of stain to each 1/2 pint of filler. If you plan to stain the wood, use the same color to tint the paste filler. If you plan to apply a finish without stain, use this guide:

<table>
<thead>
<tr>
<th>wood</th>
<th>stain for natural finish</th>
<th>color of stain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash</td>
<td>Pecan</td>
<td>Light yellow orange</td>
</tr>
<tr>
<td>Cherry or light mahogany</td>
<td>Cherry</td>
<td>Reddish-brown</td>
</tr>
<tr>
<td>Oak</td>
<td>Pecan</td>
<td>Light yellow orange</td>
</tr>
<tr>
<td>Walnut</td>
<td>Dark oak</td>
<td>Dark brown</td>
</tr>
</tbody>
</table>

Apply the paste filler to one section at a time. Brush on a light coat. Be sure to work it into the grain. When the filler is first applied, it is wet and has a sheen. As it sets, it turns cloudy and dull. The moment it looks dull over the entire section, wipe off the excess with a cross-grain movement. Repeat this procedure on each section until the entire piece is coated and wiped.

Allow the piece to dry for a minimum of 10 hours. Lightly sand out streaks with 120 sandpaper and finish sanding with 220 sandpaper.

Soft woods (pine, spruce, fir and poplar) are woods with flashy grains and require a special treatment to give a smooth, even color when stained. Several products are made for this purpose. Consult your local paint dealer because directions vary.

Stains

Stains are used to emphasize the figure or grain of wood, make a light wood look dark or make a wood look like something it isn’t. In many cases, especially if the furniture is made from walnut, cherry or mahogany, stains are not necessary. You will have to decide if a stain will help you achieve the desired final effect. There are several different types of stains, all of which have certain advantages and disadvantages.

Before applying a stain, complete all sanding. Remove all traces of dust from the surface by wiping with a tack rag or a cloth dampened with turpentine. A tack rag (usually cheesecloth soaked in varnish, linseed oil, and turpentine and kept sticky but not wet) is useful but not necessary to remove dust. Tack rags are available in most paint stores.

Before staining the entire piece, test the stain on an inconspicuous spot. Wood changes color during the finishing process, so apply the stain and then the finish to a small test area. Apply the stain with a folded cloth or clean brush. Spread it evenly and when the desired color is obtained, wipe it off. The longer stains remain on the wood surface, the deeper they penetrate and the darker the resulting color. Allow at least three days to dry.

The end grain of wood rapidly absorbs stain, and it often becomes darker than the flat surface. If this is objectionable, apply a solution of 50% shellac and 50% denatured alcohol to the end grain before staining.

- Oil stains are very popular, effective and easy to use. They are available in many colors and can be diluted with turpentine to obtain various tones and shades. Because they are oil-based they do not raise the grain. Oil stains are generally preferred for the occasional refinishing job.

- Varnish stains are also commonly available. They are a combination of varnish and a pigment designed to stain and finish in one coat. The pigment
in the stain remains suspended in the varnish during application. As a result, the pigment hides the natural beauty of the wood. A varnish stain is recommended only where the natural wood is intended to be covered.

- **Latex stains** also are available. They are relatively new. Limited experience shows that these stains do not penetrate as well as oil stains and may leave a "painty" look.

- **Alcohol-soluble and water-soluble** stains are available from specialty houses. The dry color or pigment is dissolved in the applicable solvent. Any color is obtainable by proper mixing. These stains have fast coloring speed and strength but are difficult to control. Also, water stains will raise the wood grain, thus necessitating additional sanding.

- **Low-strength stain** can be made by mixing half turpentine and half boiled linseed oil. Pigments ground in oil are added for color. After mixing, the solution is heated and then wiped on and off. On light colored or bleached woods, such as pine, poplar and maple, this light stain tends to emphasize the wood grain and make it appear rich in color. It is also effective in adding color to commercially stripped wood. The coloring pigments commonly available in paint and hardware stores include burnt umber (walnut brown), burnt sienna (cherry or reddish brown mahogany), yellow ocher (light oak), and vermillion (orange red).

**Finishes**

- **Varnish** is the most durable finish available to the amateur—it was first used by the early Egyptians but since that ancient time it has been greatly improved. Some synthetic varnishes dry rapidly to a beautiful satin sheen and others to a high gloss. Use only those varnishes recommended for furniture. Do not use floor or boat varnish on furniture.

Varnishes are available in two main types—polyurethane and resin-based. Polyurethane varnish produces a hard surface which is more waterproof, alcohol-proof and heatproof than any other finish. It also flows easily, levels well, when applied properly, provides body and depth and is transparent. However, it takes time to harden and is glossier than resin-based varnish.

Resin-based varnish is very strong and durable so three coats are adequate for most home projects. Because of its excellent properties, resin-based varnish is a highly recommended finish.

- **Shellac** is one of the earliest clear finishes. It is naturally orange and when applied on dark surfaces like walnut or mahogany, the orange color will not appreciably affect the natural wood color. Apply white shellac on light surfaces. Shellac has been extensively used because it is fast drying and is useful as a sealer. It is not waterproof; white spots form. It is not resistant to heat or alcohol and liquid shellac deteriorates with age so it cannot be stored for prolonged periods. Shellac is not recommended as the final finish for tabletops, chest tops or other surfaces exposed to water, alcohol or cosmetics.

- **Lacquer** is another common finish. Best results are obtained when it is sprayed on as in most commercial processes. Brush application is possible but the finish does not appear professional. Professionally applied lacquer dries rapidly and is somewhat heatproof. Some lacquers are alcoholproof. However, it dries too fast to apply well with a brush, cannot be applied over varnished or painted surfaces (the lacquer may soften the undercoat), scratches easily and cannot be applied over a surface treated with a penetrating oil stain unless the surface has been sealed with shellac. Unless you have special equipment and knowledge, lacquer is not generally recommended.

**Oil finishes** are sometimes used on antique furniture. Boiled linseed oil and turpentine are mixed and applied to the wood surface. This penetrates well but requires several applications. An oil finish will require 7 to 10 coats. Each coat must be allowed to dry and then thoroughly rubbed. This finish tends to darken the natural wood color. It can remain sticky and col-

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**FINISHING**

**Supplies:** Sealer, finish, brush, "0000" steel wool, tack rag. Optional: 4F pumice.

Applying the final finish to bare wood is one of the most rewarding and the most critical steps in furniture refinishing. It is useless to work for hours stripping, sanding and staining unless time and care is taken to get a permanent, acceptable finish. There are several types of finishes which are acceptable. Only you can decide which one is best for each project.

Finish features most desirable are durability, fast drying, ease of application, resistance to yellowing and darkening, water resistance, resistance to alcohol, ink and other stains. Consider the advantages and disadvantages of various finishes before making your decision.
lect dust and grime. This finish is susceptible to water, heat and alcohol.

New rub-on oil finishes have not been tested as interior finishes by anyone other than the manufacturer. The resistance of this finish to everyday hazards and the long term durability are not fully known.

Waxes, either liquid or paste, are sometimes applied to furniture as a final step. They provide a very smooth surface and temporarily protect against spills and wet glasses but if a good finish has already been applied they are not necessary. Furthermore, several applications cause a build-up which may obscure the natural wood beauty and which will eventually need to be stripped away. It will fingerprint and tends to absorb dirt.

Sealers and primers are often referred to in any discussion of finishes and a great deal of confusion exists concerning their use. Very simply, primers or sealers are usually a diluted form of the final finish coat and give a good foundation and adhesion qualities. If sealers are applied, open-pored woods such as walnut and oak do not absorb the finish coat and a better finish build-up results with fewer applications. Also, if sealers are applied to both sides of table leaves, unequal absorption or release of moisture is prevented and thus warping is less likely.

Sealing should be done after all sanding, bleaching and staining are completed but before the final coat of finish is applied. Sealing is not always necessary but the manufacturer's directions should be followed. Some manufacturers recommend their own sealers. In many cases, shellac is a suitable sealer. Two coats of a high quality satin or dull finish varnish (with the first coat of gloss because it seals better) are recommended to give enough depth to be rubbed out. You may prefer to use several coats of a penetrating sealer as the only finish.

When applying the finish use a new or clean natural bristle brush and a new can of solution or one in which hardening around the edges has not occurred. If the finish has begun to dry tiny dried particles of finish can be applied unknowingly and a rough surface results. Dust or dirt from old brushes will result in the same poor finish.

It is extremely important to remove all dust from the surface to be varnished and to complete the application in a dust-free atmosphere. Dust deposited in cracks and carvings as well as dust settling from the atmosphere will create a rough finish.

All surfaces must be dry and free of wax.

Initial brushing (with varnish or shellac) should be with the grain to give a good coat and then cross-brushed against the grain, then softly with the grain. Because of its fast drying properties, lacquer is always brushed with the grain and the finish must not be overlapped. Experiment to determine the best method for you.

A smooth, satiny varnish finish is achieved by rubbing the surface with steel wool. Between coats of varnish, gently rub the surface with "0000" steel wool and then wipe clean with a tack rag. A light rubbing with "0000" steel wool at the end will also smooth and reduce the sheen of the varnish. When rubbing down, be careful not to cut through the thin coating. If a smoother finish is desired, after the final varnish coat, rub with a pumice stone solution. Use a soft cloth wrapped around your fingers. Moisten first with water and then in 4F (FFFF) grade pumice. Then rub with the grain until the gloss disappears. Clean the surface by wiping with a tack rag. If there is still gloss, do more rubbing. Too much rubbing can remove the entire coat of varnish, so be careful. Rubbing the final coat without doing the undercoats cannot remove the gloss or rough particles underneath.

Painted Surfaces

Painted surfaces are sometimes desirable. For woods which have no attractive grain, or are stained and marred beyond repair, paint is a good answer.

If the old finish is in good condition, simply clean it by washing the surface. Some sanding may be required to smooth the surfaces. Sanding sometimes improves the adherence of a new paint coat. The first coat should be a flat oil-based primer. This will reduce the chances of chipping. In addition to regular paint, there are specialty paint kits available for painted furniture.

When refinishing furniture, there are often several different methods which accomplish the same objective. Some refinishers insist that only their method will work and that it is best. Only you can determine which method gives the best results. If the first attempt does not work, try another method. As experience and skills are developed, you will begin to understand what method is best and easiest in each situation.
SAFETY FIRST

All chemicals should be regarded as hazardous—some more than others. Read the label and take all prescribed precautions.

1. Store chemicals under lock and key, out of reach of children, pets, livestock and away from food and feed.

2. Keep chemicals in their original containers with labels intact.

3. Get rid of unused chemicals and empty containers in such a way that they are no longer hazardous.

4. Do not eat or smoke when applying chemicals.

5. Wear protective clothing and masks when directed on label.

6. Bathe and change to clean clothes right after applying chemicals; wash clothing before rewearing.

7. If chemicals are spilled on the skin, wash off immediately.

8. If chemicals are spilled on clothing, remove immediately and wash before rewearing.

9. When applying chemicals, avoid contaminating food and water supplies.