

Woodworking Finishing Procedures

Finishing

One of the most difficult woodworking tasks for beginners is finishing. There is a bewildering array of finishing products available to woodworkers today but comparative product information is hard to come by. All finishes have certain strengths and weakness when compared to each other. An excellent reference on this subject is [Understanding Wood Finishes](#) by Bob Flexner and I highly recommend it.

This article is an attempt to provide you with a few easy finishing procedures to follow and to explain the differences between types of finishes. Instead of an all-encompassing review, these procedures are written expressly for woodworkers with little experience at finishing. By following these simple steps, one should be able to achieve a very nice finish on almost any woodworking project.

General Advice

The first procedure of a good finish starts with surface preparation. Sand, scrape, or plane the surface until the surface is free of defects and uniform. The amount of sanding and the grit of sandpaper used can have a significant impact upon the way "stain" will appear on a wood surface. The wood surface should be evenly sanded to a 150 or 220 grit uniform surface. Take care to remove all glue marks and scratches, common stains will highlight these defects. If you have not done much staining you should experiment before applying any stain to your project.

When applying several coats of a film type finish, it is best to apply the gloss version of the product as a base even when a satin sheen is desired as the end product. The satin sheen products contain particles in them to defract light. Many layers of these defractors may make a finish look muddy compared to a finish built up with clearer products.

When sanding the finish between coats, sandpaper is used to remove any large irregularities and to make the finish level. Scotch pads or synthetic steel wool is used afterwards to more uniformly abrade the surface and obscure any scratches made by the sandpaper and to provide a better surface for the following finish layer. As the finish is built up into a more level surface, the grit number of the abrasives used between coats is increased.

It is not a necessity that you use the same finish technique or product on the entire project. For example, assume you chose Danish oil as the primary finish for a chest of drawers. You may use polyurethane or acrylic for the drawer boxes, interior parts, or the applied back. This would save a great deal of time and effort.

Do not apply any stains or finishes in direct sunlight.

If the finish has not dried thoroughly it will ball up or make "corns" on the sandpaper. If this is the case, allow the finish to dry more, continuing to sand and applying more finish on top may degrade the overall finish quality.

One technique I **always** use is to make a sample board out of cutoffs from the project. With this sample piece I can test different stains and finishes to see how the project will appear when complete. It is also used to test any finishing technique deviations before applying them to the project.

Be sure to read and follow the safety precautions listed on the product container.

Definition of terms:

Polyurethane: Refers to oil based products only.
Sheen: Surface reflection characteristic, either gloss, semi-gloss, or satin.
Smooth: Surface texture, smooth does not mean gloss.
Acrylic: Refers to water based polyurethane and similar water based products.

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Thinned Polyurethane

- Pro:** Durable, good choice for high wear surfaces.
Easy to apply.
- Con:** Cross grain scratches between coats may be visible.
Requires several coats for a good finish.

Procedure:

Polyurethane is a film finish. The easiest way to apply polyurethane is to thin the regular product to a mixture of 50% poly and 50% mineral spirits. Thinning the product like this offers a few advantages over not doing so. First it will be easier to apply, any runs will be less noticeable, (thinner) and the adhesion is better. There are polyurethane products that are already thinned in a similar manner, they are usually referred to as "wipe-on polyurethane".

I prefer to use Parks brand polyurethane because it is dark and cheap, I also use Varathane because it is lighter and a little better. The problem with this procedure is the difficulty explaining the difference between wet and light coats of finish. It would be advisable to experiment with this procedure before using it on your project.

1. If you are applying this finish to unsealed wood the first coat of finish will act as the sealer, apply it liberally with a brush, wipe up any "ponds", do not allow them to cure. If you are applying it to a surface that has been sealed the poly will not soak in as much. *Note: common pigment and gel stains seal the surface.*
2. After the first coat has dried, sand lightly with 220 or 320 grit paper. This poly mixture is very easy to sand, take care not to sand through the finish into the stain, if any. Wipe off any dust caused by sanding.
3. Apply a wet, uniform coat with a foam brush. After the finish has dried, sand with 320 grit paper. Repeat this step until the finish appears to have sufficient build. (one to three coats)
4. Continue applying the poly with a rag at this point. Apply the finish sparingly but try to maintain a wet edge to avoid any lap marks. After the finish has dried, sand with 320 grit followed by a synthetic steel wool pad. Be sure to wipe off any dust caused by sanding. Repeat this step until the surface is free of any irregularities. (two to five coats)
5. You may call the finish complete at this point or repeat the previous step with a different sheen of the same product.
6. This final step is optional. Rub out the finish using #0000 steel wool to a uniform sheen level. You may apply a paste wax to the surface if desired.

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Danish Oil

- Pro:** Smoothest most easily obtained "perfect" finish.
Easy to repair.
- Con:** Not as durable as film finishes.
Finish may require periodic maintenance.
Procedure requires lots of elbow grease.
Should not be applied over common pigment or gel stains.

Procedure:

Danish oil is considered to be a penetrating oil type finish. In actuality, the oil does not penetrate very deeply, just a little deeper than typical film finishes. When using this type of finish, there is no need to sand the wood surface with anything higher than 180 or 220 grit sandpaper prior to finishing. In order for this finish to work properly it must be able to penetrate into the wood. It will not be able to do so if you have stained it with the commonly available pigment or gel stains. If you wish to stain the surface you can use a water based dye applied first or use a tinted Danish oil.

This finish is one that even an amateur can apply and achieve excellent results if the proper steps are followed. There are several procedures that are similar to the one outlined below, any of them will work, this is a simplified version. I use Deft Danish oil but the procedure should be the same for all "Danish oils".

1. Even if you wish to use this product as a stain as well as a finish, apply the "natural" color of the product to end grain areas first then the colored version. This will keep the end grain from looking darker than the rest of the surfaces. Apply a very wet coat to all surfaces, allow the oil to stand on the surface for about 30 minutes, apply more to any areas that become dry during this time period. After 30 minutes or if the oil starts to become a little "tacky", wipe it all off.
2. Immediately apply another wet coat of oil to the surface, allow to stand for about 15 minutes or until it starts to become tacky. Wipe all oil off of the surface. The surface will "bleed", or seep oil onto the surface for a few hours after application. You do not want this bleeding oil to harden so wipe the surface down every half hour or so. Open pore woods like oak will bleed more than woods such as maple. Note, the more vigorously you wipe the oil off, the more it will bleed, heat causes this.
3. From now on, you should apply the finish every other day. You may continue to use the tinted version of the product or switch to the natural colored oil at this point. From this point onwards, the oil will be applied with sandpaper. Start with 320 or 400 grit black sandpaper and wet sand the surface using the oil as a lubricant, This will work the oil into the surface and smooth the surface as well. You must wipe all of the excess oil from the surface before it becomes tacky during each application. Continue this operation every other day, switching to a finer grit of sandpaper each time. You can keep this up a long time but the benefits start to diminish after 600 grit.
4. After you have applied all of the oil you want, you may now apply either a coat of lemon oil or solvent wax (Watco) using the sandpaper method. This will become the final finish. As an alternative, you could use a paste wax wiped on with a rag and buffed out. The preferred wax to use will be colored to avoid any white spots.
5. About every year or two, you may wish to apply a coat of the natural finish oil and / or wax to the surface to restore it's sheen.

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Sprayed Lacquer

- Pro:** Easy to apply.
Quick process.
100% adhesion with underlying layers.
Easy to rub out.
- Con:** Not as scratch resistant.
Low solids content, requires several coats.

Procedure:

This procedure is for spray can applications only, in particular, Deft lacquer products.

1. Use the gloss sheen for the initial coats of finish. If you are applying this finish to unsealed wood the first coat of finish will act as the sealer, spray on two to three even coats. If you are applying it to a surface that has been sealed, spray on two even coats. Allow the finish to dry. *Note: common pigment and gel stains will seal a surface.*
2. Lightly sand with 220 or 320 grit paper, wipe any dust from the surface and spray on another coat of the gloss sheen, allow to dry.
3. Depending upon absorption, you may need to repeat the previous step until the surface is smooth.
4. Lightly sand with 320 or 400 grit paper and wipe the dust from the surface. You may switch to another sheen now if desired. Spray on this coat and allow to dry.
5. Inspect the surface and repeat the previous step if desired.
6. You may choose to leave the surface as-is, or rub it out depending upon the look desired.
7. To rub out the surface, sand it lightly with used 1000 grit paper then switch to #0000 steel wool. Lacquer rubs out very easily, use just enough force to make sure every surface has the same sheen. Thoroughly clean the surface and apply a paste wax or furniture polish.

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Wiping Varnish

Pro: Durable, good choice for high wear surfaces.
Requires fewer coats than wiping polyurethane.
Easy to apply.

Con: Cross grain scratches between coats may be visible.

Procedure:

This procedure for wiping varnish uses the General Finishes line of products. The waterlox line of products could also be used if the material is thinned one to one with mineral spirits. The best description for this product is "high performance polyurethane". Compared to the thinned polyurethane technique this product requires fewer coats, and has a harder more durable surface.

1. Apply a wet, uniform coat with a foam brush. After the finish has dried, sand with 320 grit paper. If you are applying this finish to unsealed wood, you may need to repeat this step.
2. After the first coat has dried, sand lightly with 220 or 320 grit paper. This product is very easy to sand, take care not to sand through the finish into the stain, if any. Wipe off any dust caused by sanding.
3. Continue applying the finish with a rag at this point. Apply the finish sparingly but try to maintain a wet edge to avoid any lap marks. After the finish has dried, sand with 320 grit followed by a synthetic steel wool pad. Be sure to wipe off any dust caused by sanding. Repeat this step until the surface is free of any irregularities. (two to four coats)
4. You may call the finish complete at this point or rub out the finish.
5. To rub out the finish, abrade the surface with #0000 steel wool (with the grain) to a uniform sheen level. Apply a solvent or paste wax to the surface afterwards.

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Water Based

- Pro:** Durable, good choice for high wear surfaces.
Easy to apply.
Dries fast.
Water cleanup.
Low odor.
Uniform sheen.
Self leveling.
High solids content, fast building.
- Con:** Low resistance to some household chemicals.
Some formulations appear to have a "white" cast to them.
Very difficult to remove cured finish.
Water can mark a cured finish, (water marks should go away after 24 hours).

Procedure:

There are several names for this product. Most likely, anything that is labeled varnish, polyurethane, or Crylic, appears "whiteish" in liquid form, and is cleaned up with water is an acrylic. These products are fairly new to the consumer market and the formulations are still being perfected.

Acrylics are often labeled as "water white". The general definition of this is that the product will impart no additional color to the surface. This may or may not be a desirable feature depending upon the circumstance. Acrylic applied directly over raw walnut or cherry will have a VERY different appearance that any oil based product which usually impart varying degrees of an amber color.

Even though this product has many good qualities, it is controversial in use on fine furniture. I usually reserve this product for use on interior furniture components, house trim, and shop furniture. These are the applications it seems ideally suited for.

Under no circumstances should you use real steel wool as an abrasive between coats of finish!

1. If you are applying this product over any other oil based stain or finish, abrade the surface with a scotch pad or synthetic steel wool to provide "bite" for the acrylic and keep it from beading on the surface. Polyurethane can be used as a sealer for acrylic. This will help avoid the grain raise problem associated with water base finishes. However, polyurethane will impart an amber tone to the finish, this may or may not be desirable.
2. Apply a coat of sealer made by the same manufacturer of the acrylic if possible. After the sealer has thoroughly dried, sand with 220 grit paper followed by a scotch pad. If the sealer has been applied over an unsealed surface you may need to repeat this step depending upon the amount of grain raise.
3. Apply as many coats of the gloss product as desired to build the surface. In the right conditions, this products cures quickly, you may apply consecutive coats usually within two hours. There is no need to sand between coats if applying them consecutively.
4. After the surface has been built up to the desired level you may switch the sheen to semi-gloss or satin for the final coat(s). Apply one or two coats of the final sheen.