Wiping Varnishes

The purpose of these notes is to help the home hobbyist produce professional quality finishes. Scanning comments on the Web boards, it is clear that many woodworkers find finishing scary and difficult. But it does not have to be that way. I am a hobbyist and IMHO, I can consistently produce finishes that are equal to the best finishes in commercial show rooms. I don't have sophisticated spray equipment; I apply finishes by hand. I certainly don't claim to be an expert, but the good news is, you don't have to be an expert! With good technique, good materials, and patience, getting a top quality finish is less difficult than you might suspect. Part of the key, like most everything in life is practice, but hopefully these notes will help. I think in fairness to the pros out there, that there are certainly specialized finishes that are hard to achieve at home and matching an existing finish is difficult, but fine finishes are well within your ability.

Making and Using a Wiping Varnish

Varnishes, including polyurethane varnishes (AKA poly), provide a great deal of protection to your furniture and can be buffed to anything from a satin sheen to a high gloss sheen. Varnish is a common home workshop finish. Wiping varnishes are available off-the-shelf. Indeed many so called Oil finishes are wiping varnishes, or wiping varnishes with oil added. Wiping varnishes are nothing more than regular varnish with thinner added. But, you are paying varnish prices for that thinner. You can make your own with the varnish of your choice (poly, non-poly, spar, etc.) so you have better control over its characteristics, for example: type of resin, amount of resin, and quickness of drying.. And, you will pay less money. A note of caution: I am specifically referring to oil based varnishes. The chemistry of water based products is much more complicated, and thinning with water can cause severe problems for some (many?) water based products. For now, oil based products are, IMHO, better in most respects anyway.

I'm most familiar with Minwax poly. This is what is known as a long oil poly; it has a ratio of oil to resin that is high on the oil. This makes a finish that has more give and takes abuse better than a short oil poly. Because it has more give, it does not buff to a high gloss as well. For me this is a good trade off as my furniture takes the abuse of a family and I rarely finish to a high gloss. Varithane Professional is a commonly available short oil poly. It scratches a little more easily, but takes a better high gloss. Spar, an exterior varnish, has a very high proportion of oil so that it is flexible enough to withstand the expansion and contraction that exterior wood goes through. There are many good varnishes, these are just two I'm familiar with.

Why would you use a wiping varnish? Brushing a varnish takes a certain level of skill to do well. Brushing varnish dries slowly, so dust tends to settle into it, making more work later in finishing the finish. Brushing tends to produce thick coats, making control of the final thickness more difficult leading to that amateur thick build up, and leads to runs, again leading to more work in the final stages of finishing. Brushing well requires expensive brushes that require proper care; ever set down a brush to take care of something for

a minute at the end of a job, only to find it still sitting there the next day? Wiping varnish has none of these problems.

There is nothing to making a wiping varnish. Take varnish and add thinner until it flows easily from a wet rag. It seems that most people prefer a mix of about half and half. I've seen posts from people who prefer more like 2 parts varnish to 1 part thinner. It depends on what you are wiping, how thick the varnish is out of the can, and just plain personal preference. The mix need not be measured exactly. I mix mine in small batches by the glug to glug method, one glug varnish to one glug thinner. Just as you have a choice of varnish, you have a choice of thinner: Mineral spirits or Naphtha (VM&P). The primary differences to my mind are: Mineral spirits smell more and dry more slowly; Naphtha smells less and dries faster. Naphtha sometimes dries too fast, on complicated pieces it may start to dry and drag before you can wet the whole surface. It might be best to try mineral spirits first. Naphtha is also a little clearer, but not so I notice. Make only as much as you will use over a 2 or 3 day period, as the mix sometimes starts to set up in the jar.

To use, wiping varnish is also simplicity itself. Pour some of the mix in a wide mouth container. Something like a large butter tub works well (and between coats I set a scrap of board over the tub for a quickie easy to use lid). Use a lint free cloth, I like old T-shirt. I like a rag about the size of a small wash cloth. Drop the cloth in the varnish, squeeze some out so it is not dripping, and wipe on. You want the surface wet, but not dripping. Work quickly as the varnish will start to dry very fast. If you go back over it a minute or two later the finish will drag, creating rag marks. If you miss a spot or get a run, don't worry about it. Just get the miss with the next coat, and take care of the run after it fully dries (See using a utility knife blade). The solution is thin enough that it will flow out very nicely - just get it on and let it smooth itself out, no need to wipe with the grain. Somewhat surprising, the finish goes on thin enough that it is easy to put on vertical surfaces without runs. Because it dries so fast, very little dust will get into the finish.

It will take six to nine coats, depending on what look you want. You can use as few as four coats, but don't expect that to provide full protection from water and such. I figure four coats equals one brushed on coat, more or less. Each wet coat only has half the varnish the same wet coat would have if brushed on, but the wiped on coat when wet is much thinner than a brushed on coat when wet, so in fact the wiped on coat has rather less varnish than the brushed on coat (half of half gets you to a quarter). The good news is that each wiped on coat takes very little effort, imagine just wiping it down with a wet rag. And, depending on the humidity and temperature, you can get three to five coats on in a day, so the whole thing takes no more time than brushing. The end result is a nice smooth, nearly dust free finish.

There is no need to sand between coats that are put on a couple of hours apart as the finish has not had time to cure. After a few coats in one day, let it dry over night. Then sand just to smooth out any dust nibs with 400 grit, take care of any runs or major goofs, and rub out to a uniform flat sheen with gray Scotch Brite or #0000 steel wool, before putting on the next set of coats. Be sure to sand or rub with the grain in straight lines, no windshield wiper action! If the finish went on smooth enough, skip sanding and just rub

out with the gray Scotch Brite. I find it important to get a uniform flat sheen before more coats as sometimes the spots of flat sheen where dust nibs or runs were removed show though as a different sheen than the adjacent areas.

After drying fully, you can rub out the finish to remove any flaws to produce a professional quality finish.

Oil Finishes

Oil finishes are popular because they are very easy and look nice. Whereas varnish leaves a hard film on the wood, oil finishes leave a thin soft film. Because they are thin and soft, oil finishes do not provide much protection from wear or spills. The saving grace is that they are easy to repair - just rub down with steel wool or gray Scotch Brite and wipe some more on.

There are a lot of myths surrounding oil finishes, but there is very little difference between the common oils. Some people swear by tung oil, others linseed, but that is like arguing whether Ford or Chevy makes a better sedan. If you stand back a little you'll see there is little practical difference. Add to that the fact that just as "cherry finish" furniture is often not cherry at all, "tung oil" finishes often have little or no tung oil in them. The person who swears by tung oil is quite possibly using linseed or other oil. Another myth is that oil penetrates the wood and makes it harder. Lastly, many oil finishes (for example almost any Danish Oil), are really oil, varnish, thinner mixes. A few "oil finishes" are just varnish and thinner. Watco Danish oil is perhaps the most commonly used Danish oil (oil, varnish, thinner) and is a fine product. It comes natural or with stain included.

Because "oil finish" can mean most anything, you may want to make your own. You can buy pure tung oil, pure linseed oil, or boiled linseed oil. You can also get polymerized tung oil, but that is closer to varnish in how it behaves. Boiled linseed oil has metallic dryers added and is a good choice since it cures in a reasonable amount of time. If you want more protection you can add varnish (e.g. poly) and thinner. A mix of about 1/3 oil, 1/3 varnish, and 1/3 thinner will make a standard "Danish Oil". You can experiment with more oil or more varnish to give the finish you like best.

To apply an oil finish just wipe some on, let sit for a few minutes, and wipe off. If you have wood with pronounced pores, it may bleed for some time. That is, the oil may seep out of the pores to form little bumps if allowed to dry. If this happens, just wipe off every hour or so until it stops. If this happens and it dries, just scrape with a blade to remove, and continue. To get a smoother finish you can wet sand with oil and 400 grit wet/dry paper. Many people start with wet sanding and coarser grits to make a slurry of oil and sanding dust to fill pores, but I prefer to leave the pores be. Because the resulting film is soft it cannot be built up to a thick film. Three coats is about as much as you should put on.

Using a Utility Knife Blade to Smooth a Finish, (or No More Runs and Dust Nibs)

This is a great trick I learned from Jim Kull over on the Wood Mag Finishing Forum. It works with a regular single edge razor blade too. This will be obvious to you if you are used to using a cabinet scraper, because all this is is using a utility knife blade as a cabinet scraper. The blade is used to scrape flaws in a finish flush.

To remove dust nibs and other small bumps in a finish, hold the blade in one hand, between thumb and forefinger. Hold the blade nearly straight up, tilted just a bit toward the direction of travel. Sweep the blade across the finish just as if you were sweeping crumbs off a table top with a credit card. You will feel the snag of the bumps; after a couple of passes it will feel (and be) smooth. If you are doing this between coats of varnish, you can now rub out with gray Scotch Brite or #0000 steel wool before the next coat. If using shellac or lacquer, you can now put on the next coat. If in the final stages of finishing, you can begin rubbing out. You may want to round the points or corners of the blade to keep from scratching finish accidentally.

If you have a real booger or a run, you need to focus your energy on the problem. Fortunately, this is very easy to do with a blade. People often use sand paper which is very hard to use well. Invariably, with sand paper (and a sanding block) too large an area is sanded, or (with say a finger behind the paper) a groove or divot is sanded into the surface to show clearly when the next coat is applied. To get just the run and nothing else, here is what you do. Hold the blade in both hands, between thumbs and forefingers. Push with your thumbs so the blade bends a bit in the middle. Now when you tilt the blade a little, just the bowed part hits the top of the run, and nothing hits the rest of the finish. Now push forward with the blade bearing on the run. You will shave just a little finish off the top of the run. You will see a dull streak that is the shaved flat top of the run. Repeat. As you shave off the top you will see the distinct outline of the run take form. Just as you shave the run flush with the surrounding finish, the distinct outline disappears. This will take anywhere from two or three shaves to several shaves depending on how bad the run is and how hard you bear down. But each shave takes all of two seconds, so in well under a minute the run is gone and everything is nice and flat and even. You will want to do this in good light that reflects up off the surface so you can really see what you are doing.

Finishing a Finish - Rubbing Out a Film Finish

Just as you need to sand your wood smooth to remove flaws, you need to rub out your film finish (lacquer, shellac, varnish) if you want it to be flawless. There are innumerable ways to do this depending on the amount of effort you want to spend, whether you want it mirror smooth or not, satin, semi-gloss or full gloss. As always practice on some scrap first - you are almost done, you don't want to have to strip

the piece and start over! Make sure the finish is well cured, as much as a month for poly, especially if aiming for a full gloss. When the finish has no smell, it is cured. This is less of an issue if aiming for satin.

If you have done a really good job of getting the finish on smoothly and without too much dust, for example if you use a wiping varnish, and sanded smooth before the last couple of coats, you may only need to polish with a fine abrasive polish. If you want a mirror flat surface or if you have brush marks, orange peel, or lots of dust nibs, you will need to sand first.

We'll start with sanding first, although you might skip this step. If you have some real problem areas, hit them with the blade first. As with sanding wood, you want to go through a sequence of higher and higher grits. The full sequence is something like 220, 320, 400, 600, 1000, 1500, 2000, varying on the paper at hand. There is a real danger of sanding through the finish, which is a pain to fix, so take it slow and easy. If you have lots of sanding to do, because you have lots of brush marks or because you want to sand to a glass smooth finish, make sure you have a good build of finish first. I never start below 400, but if you find 400 is just taking forever, you may need to. I often start at 1000. I recommend starting high, and if too slow, drop back. The 1000 gives a very nice satin finish all by itself, and 1500-2000 give a nice semi-gloss. I often stop there and finish with paste wax.

You can get the high grit papers (above 600) at an auto parts store that sells automotive paint supplies (and likely listed under that heading in the Yellow Pages). You can get stearated 220-400 which is used dry. The other papers are used wet. I generally use water with a little soap, which I keep in a spray bottle. You can also use mineral spirits or light oils. But, water is nice since it is free and non-toxic and non-smelling. I wouldn't use it on shellac though; for shellac I use mineral spirits. Use a sanding block or you will not get a flat surface, and be very careful not to tip over the edges as it is easy to sand through there. If you want a dead flat surface, sand until the entire surface has no sheen. First the tops of brush marks or tops of orange peel, etc. will lose their sheen as they are sanded flat; valleys will remain shiny as the sanding has not reached them. As everything flattens out, there will be fewer and fewer shiny spots. When there are no shiny spots, you are done and you can quickly move up through the grits. Otherwise, just sand until nice and smooth as you run your hand over it.

An interesting alternative to sand paper was posted over at the Oak site, namely using fingernail polishing blocks available at beauty supply stores. I got some at the local Sally's and so far they seem to work well. They are made from coated stiff foam in blocks maybe 1 inch x 1 inch x 3 inches, and are used wet (I've only tried soapy water). I have not compared carefully to anything, but medium through super fine is perhaps something like 600 -1500 grit. I'm told as they are used they get finer and eventually can be used to achieve a high gloss.

If you want to continue after sanding, or if you did not need or want to sand, you can polish the finish. The easiest thing is to rub out with gray Scotch Brite or #0000 steel wool. The steel wool is a little finer than the Scotch Brite. The main advantage of the Scotch Brite is that it does not shed like the steel wool

whose residue can stain the finish with rust later, or get hung up in cracks and such. That said, I often prefer the steel wool. You can rub with the grain to remove all shine and leaves a nice smooth feeling surface. This does not take out real bumps and such. If you want some shine you can rub out with wax. I prefer liquid wax, but paste wax works too. I find it easier to get an even shine if I rub out dry first to no shine, and then repeat with wax. This leave a super smooth feeling semi-gloss finish and is a definite improvement on no rubbing out. This process leaves almost, but not quite, invisible scratches in the finish. In intense shop light, with your nose inches from the surface, you will likely be able to see them. It is very unlikely anybody will see them on the piece in use in your home.

You can also rub out with various compounds. Traditional compounds are pumice (1F - 4F grits, with 4F being finest), and rotten stone (very fine for a gloss finish). I use only 2F pumice and 4 F pumice, since that is what the local store carries. These are used wet with water or oil, and generally used with a felt block (I use one of Sara's old athletic socks rolled into a ball!) The pumice gives a nice semi-gloss, with the 4F pumice giving a little more gloss than the 2F. A little goes a long way. The directions call for wetting the surface (easy with a spray bottle) and sprinkling a little powder on the surface. But, I like to mix some in a dish with water and brown universal tint ($2 a tube at a paint store, Home Depot) to make a brown paste, or I make a thin mix of pumice, color, water, and soap in bottle like a catsup dispenser bottle. Then if a little gets into a crack or such, it is not noticeable (coloring polish is another Jim Kull trick). These products work quickly and well by hand, but may not be available if you don't have a woodworking store nearby. They also work fine with a wool bonnet on a RAS (tie on bonnets can be had at an autoparts store for $3).

Another group of polishes are automotive polishes. Automotive finishes are very similar to many furniture finishes so this is no surprise. I first figured this out years ago while trying to finish a table top, but with more reading I find that this is common practice. After sanding to 1500 grit or so (or no sanding) you can use white automotive polish (which can be tinted brown) applied by hand. This will give a full gloss finish. I've tried this with a buffing bonnet on my random orbit sander with limited success - I think it is just too fine. You can get this polish at any auto parts store, or even your super market. For power buffing, including using a random orbit sander with wool bonnet, you can use Maguires polishes. I use #4 heavy cut, #2 light cut, and #9 swirl remover, as per an article by Jeff Jewitt in Fine Woodworking. I've heard of others using a slightly different sequence. These too can be tinted. The number 4 and 2, when used with a random orbit sander (which does not leave swirl marks) give very nice semi-gloss finishes. Because the Maguires starts out more abrasive than the white polish, less fine sanding is needed first.

One last note, if you are using wood with large pores that have not been filled, you should use the last coat of finish with the same gloss as you will rub out to. If you use a gloss finish, but rub to a semi-gloss finish, all the pores will be little shiny dots.

Further Links

Here is a site with a number of articles by the Master (Jim Kull): click here

More good stuff by profesional finisher Dave MacFee: click here

The Homestead Finishing products site, complete with articles by profesional finisher and author Jeff Jewitt: click here

Books

The two finest books I know are *Understanding Wood Finishes*, by Bob Flexner, and *Great Wood Finishes*, by Jeff Jewitt. Bob's book tends more towards the technical chemistry type issues, although it covers practical issues as well. Jeff's book tends more towards practical issues and goes over details of finishing 14 distinct projects after first covering the various topics in general.

Restoring a shellac finish

This is one of those rare projects that got done in a couple of days, and even more rare, got done without one trip to the hardware store!

One day my wife announced we need a dresser for the boys. I don't like store bought furniture, and my to-make list is a mile long, so off we went to the hugest, multi-day flea market and antique sale I will likely ever see, out in Brimfield MA, that is held three times a year. We were there five minutes when we found this dresser. It is a basic ribbon mahogany bow front dresser. I doubt it is a true antique as the drawers have machine cut dovetail joints. But, it is not too new as the finish is shellac. The bottom drawer needed a new bottom. One knob was missing, but the knobs were basic hardware store wood knobs badly painted brown and were going to get replaced anyway. The finish was crackled, scratched, gouged in places, and opaque, and some edges had paint where the dresser had been bumped into walls. In short, it was perfect!

This is the sort of piece that is often fixed up by being painted, or if the owner is more ambitious, the piece is stripped and refinished. But, both are poor choices. I restored the existing finish in short order in a few steps.

1. Wet thoroughly with alcohol, and scrub gently with gray Scotch Brite pad. Dip pad in alcohol as needed to keep the finish nice and wet. Keep at this for a few minutes. Be sure to scrub off paint on edges, etc. Then wipe the slurry out evenly with a rag soaked in alcohol, and let dry. The alcohol dissolves the top portion of the shellac, and the solution flows into the cracks, scratches, and other flaws. This will do a good job of reducing cracks, scratches and such. Keeping it wet for less time will keep more of the flaws, longer will remove more flaws.

2. I padded on a little orange shellac to some spots where the finish was too thin. If you have some crackling left that you want to remove, you can also pad on a little shellac to do that. (For more on using shellac see the articles on this page)

3. Sand with 400 no-load paper. You can sand until the finish is glass smooth or you can sand lightly. The pores are not filled on this piece (which is fine as I'm not a fan of filled wood), so I just sanded lightly to give a smooth to the touch feel. A light sanding is less likely to cause you the grief of sanding through the finish. You can also sand with higher grit wet/dry papers with mineral spirits, but I don't think that is needed.

4. Buff out with #0000 steel wool and brown tinted wax. (more on rubbing out finishes). This leaves a wonderful silky smooth feel and soft glow to the finish.

5. To highlight the pores a little, I then waxed with brown Kiwi shoe polish (which is just dark brown wax).

Because shellac dries so fast, you can do steps 1-3 one afternoon and steps 4 and 5 the next morning. When you are done it looks like a fabulously maintained family heirloom.

The last thing to do was take care of the knobs. For some long forgotten reason, I had a bunch of hardware store maple knobs in two sizes sitting around the shop. I added a bunch of medium brown Transtint dye (from Homestead Finishing) to some orange shellac, and after several coats, the knobs matched the dresser perfectly. The knobs were steel wooled and waxed to match the sheen on the dresser.

I can't believe we are going to give this thing to two little boys! I'll end up redoing it again in 20 years!