

Sanding and Finishing: The bane of a woodturners existence. Or is it?

Mark Salusbury

Why do we turn wood? Beyond the joy and learning we experience in our solitude, it's to produce a finished piece we can be proud of. Now, to produce a finished piece we need to be proficient in three distinct skills; woodturning, sanding and wood finishing. While it's hard to master all things, lets begin by getting comfortable with some basics so that after the turning is done we don't wince at the thought of what's ahead. Assuming you've been successful at creating a well shaped and proportioned piece with an acceptable "off-the-tool" finish, the next stage, sanding, is where we take the first step in keeping our following stage, finishing, to the very minimum.

What's required :

- a firm yet compliant 2" or 3" diameter sanding mandrel/backing pad with a flat face and a recessed profile behind the hook-and-loop surface
- quality abrasive discs (I can't stress this too much) sized to match your mandrel so that the discs overhang the face of the mandrel just slightly (+/- 2mm) in grits from 80 to 800 minimum
- a variable speed electric drill. I like 0 – 2400 rpm range rather than slower speed drills
- a lathe that will allow you to readily reduce the spindle rpm down to about half your turning speed or less
- good lighting, preferably overhead fluorescent for general illumination plus a quartz 'task' lamp that you can move and locate so you can look at the work, lit obliquely.

Okay, now that we have the materials in-hand lets begin sanding. But first ya gotta put on your "sanding mentality". Sanding is an enjoyable process in which you'll be refining your tool work, your design and the fibres of the wood to within a hare's breathe of your proud expectations.

As in your turning, you want to invest in quality materials that cut well, hold their edge, allow you to follow your preferred profile broadly yet be able to seek into details and produce crisp edges and corner profiles. A good mandrel/backing pad sized appropriately to the profile and/or size of the piece and quality abrasives is your best investment. While it's true that quality costs more, it also lasts longer, produces better results, reduces stress and gives greater satisfaction. You're worth it, please trust me on this.

With the drill in your hand and your lathe speed slowed down to about half your speed when turning you can begin your sanding. Use a light touch and let the abrasive do the work. Too much pressure will only heat up the wood, resulting in tiny heat cracks that you'll never be able to sand away. Sanding has to be a fluid process in which the abrasive broadly removes a microscopic layer of material while you deftly pan the revolving sanding disc across the surface of the piece. Beginning with the coarser grits you'll level your imperfect tool work and tame unruly grain.

Stop your lathe and inspect the piece. Is there still any torn grain? Here's where the quartz "task lighting" and/or strong, diffuse natural light is important. (Editor's note: quartz lighting gets hot enough to set fire to shavings or sawdust. Modern LED lighting, colour temperature of 4500 – 5500 ('daylight') is a safe quartz replacement). Inspect the piece, still in the chuck, with the light hitting it incidentally, looking at the surface rather than the figure and grain. Sand areas that need spot attention, gently, with the lathe stationary and your sanding disc slowed and in constant movement over the area. Do this while you're at the coarser grit step making sure you remove all the defects, then blend these areas in with the rest of the piece with the lathe running. Move on to the next grit and repeat.

Obviously, the better your tool work the less grits you'll have to go through. Improve your tool work and you'll have to sand less, using fewer abrasives, saving you time and money. That said, a light pass with grits from 80 or 120 through 800 is a good progression to think of. Why 800 grit or finer? You want your finished piece to have some kind of sheen or luster right?

One way to achieve this is to quit at 200 or 320 grit, then layer on coat after coat of varnish to fill in the microscopic, voids, scratches and swirl marks left by your abrasives, at the risk of making a piece that looks like plastic or worse, gloppy. This is a very time and varnish consuming process and the more you fuss, often the worse it gets, kinda like "Brer Rabbit and the Tarbaby" (Uncle Remus Tales) http://www.longlongtimeago.com/lta_fables_brer_rabbit_tarbaby.html .

The other way that produces a better result in my opinion, is to gently and smoothly sand the surface of the piece through finer grits then seal the piece with two, but no more than three conservative coats of varnish, hand sanded lightly with 1000 grit abrasive between coats, then finally buff the piece with a micro abrasive pad, with or without a tiny bit of wax.

Sheen is up to you. If you use a "gloss" variety of finish you'll get the best clarity to show off your piece's grain and figure best. If you like gloss you'll surely have it if you sand to finer grits. If you want to soften the look or make the piece look more natural, cut the finished surface back using a "grey" microfiber pad or "oil-free" "0000" steel wool, both available

from Lee Valley and other quality woodworking supply retailers.

Alternately, sand to even higher grits, 2000 and beyond and apply only oil, wax or no finish at all, letting the woods natural colours and iridescence radiate unhindered by chemical coatings. The amazing work of the late Gordon Dunphy will show you what I mean. <https://vimeo.com/95606341>.

In future installments I'll discuss:

- abrasives I use, how I use them and what to avoid based on my experiences
- what kind of finish to apply to complete your piece
- oils versus varnishes
- preparing a final surface, shellac and varnish finish

Fluids and Finishes...What Works With What

Mark Salusbury

So now you've got a great piece that is sanded to perfection. What to do now to make it sing? Some sort of finish is probably required and you may want to add a hint (or a lot) of colour somewhere in the mix.

The following is a list of suggestions. I've organized them generally in order of what can be applied over what. There are always some exceptions though and I'll pick up on them as we go. You have the option of applying dye, a colour glaze or simply building finishes as simply as you'd like to achieve your preferred affect.

Briefly, anything can be put on bare wood. However in order to get the best from your piece you need to determine what kind of wood it is, whether it has uniform figure or blotch-prone grain, whether a hint or a splash of colour will benefit it and the purpose of the piece; functional kitchenware, gift or art.

Here are my suggestions, in a nutshell, in case you don't want to read the good parts:

- Water penetrates and raises the fibres of the wood and needs to be sanded back.
- Dye may only be put over bare wood.
- Shellac also raises woods fibres initially and needs to be sanded back, but being alcohol based is compatible with water and itself.
- Lacquer is a substitute for shellac and like shellac may be topcoated with any other products but may not be put on top of any other product except cured dye or itself.
- Epoxy Resin may be applied coloured or clear over bare wood, dye, shellac or lacquer.
- Coloured Glaze is applied only over a pre-sealed wood surface, otherwise it's a stain or dye.
- Oil based finishes can be put over any cured, wax-free surface.
- Water based finishes can only be applied over dewaxed shellac or lacquer pre-coats/ sanding sealers or other water based products.
- Waxes cover everything once the surface you're applying it to is fully cured.
- Oils are generally used in lieu of any other finish with some exceptions as listed later.

The following is for those who crave more detail.

Read on and I'll explain, beginning with bare wood:

Water:

Always use distilled water; tap water may contain minerals or dissolved metals that could react with tannins in the wood causing black stain marks.

Application

- Lightly spray onto the wood to raise the grain during the sanding process and then sand the piece once it's dried
- Lightly spray on the wood to wet sand softened bare fibres or later to lightly abrade a finish coat
- As a base for dyes or pigments you might want to mix to colour wood
- As a factory base or for you to dilute water based paint, varnish or urethane. Once thoroughly dry, any alcohol, thinners or spirits based fluids are compatible.

Dye: Water or alcohol based

Application

To colour a bland wood or to accentuate the figure in a uniformly figured wood.

- If your next step is to coat with dewaxed shellac (alcohol based) use a water based dye to avoid the risk of causing an alcohol based dye to become reactivated by the shellac
- If you're next going to apply a water based varnish apply either a water or alcohol based dye but let them dry thoroughly to avoid interaction with the varnish
- If you're going to next coat with an oil based varnish or urethane you can use dyes with either base without concern after the dye has dried thoroughly

Shellac:

Dewaxed only – Zinsser 'Sealcoat' or mix from dewaxed flakes (see <http://www.shellac.net/ShellacFlake.html> for mixing instructions).

Application

- Thinned 25%, applied uniformly and liberally to seal or unify the surface grain pores
- Thinned 10%, applied uniformly but lightly as a sanding sealer prior to top coating
- Un-thinned as a finish
- Thinned 25% as a 'pre-coat', this makes an excellent base for adding a subsequent finish coat or a 'colour glaze', as it unifies the woods pores so all accept colour or finish equally. This is especially important in woods with undulating grain structure like pine or cherry which are prone to looking 'blotchy' if not sealed first.
- As a sanding sealer thinned 10%, shellac will fill pores and act as a grain filler too. Let it dry completely according to manufacturers recommendations (this will take longer in hotter, more humid conditions) otherwise your sandpaper will clog easily
- Used as a finish, properly applied, it requires no sanding between coats as the alcohol base slightly dissolves the previous dried film permitting the finish to build readily.

Lacquer

•See 'shellac' above Notice that their names share the letters 'LAC' and thus may be used in lieu of each other for our purposes as a finish. I have no experience with lacquer as a sealer but I'm sure it would do a great job if applied un-thinned and allowed to cure fully prior to top-coating. Like shellac, lacquer is an excellent finish and will build on itself without sanding if recoated once its surface is dry but not left to cure. Once it has cured, a fine sanding is required to provide "tooth" for subsequent coats.

Epoxy Resin

Application

- To offer a firm structural and/or chemical resistant finish to your work
- To thoroughly fill wood grain and pores.
- As a final finish and/or colourant (by adding Mixol, Transfast or artists oil colours).

Generally this is an extreme step for woodturners but if you want to take it, now's the time. Epoxy resins can be put over bare wood or a cured, dewaxed shellac precoat or lacquer but not over any water or oil based finishes or wax.

Colour Glaze

"Glaze" is a mixture of varnish and a colourant (base compatible artists paint or commercial wood stain) mixed to a thin consistency and hue, which is applied over a sealed wood surface.

Application

To build a uniform colour on the surface of the wood or to accentuate the figure in a informally figured wood.

By sealing the grain of the wood with thinned dewaxed shellac or a thinned water based finish first, a 'glaze' will be received by the wood equally overall so no 'blotching' will occur. Applying a glaze is a much more controllable way to add colour; you apply it thinly and if it's not striking enough once its dry, add a second or third coat to build the colour up. You can also apply layers of different colours to create depth and custom hues in your finish

- Spirits based – artists oil paints or commercial wood stains (Minwax, Varathane etc.) may be thinned with a gloss oil based varnish (General 'Salad Bowl Finish works really well) to your preferred shade and wiped or brushed on sparingly. Several coats are usually way better than one. Top coat with an oil based varnish only.
- Water based – artists acrylic colours or a water based commercial wood stain (as above) thinned with a gloss water based varnish (i.e. Emtech EM 2000WVX by Target Coatings) will work well if applied as above. Top-coat with your water based finish of choice or, once thoroughly cured (not merely dry) any oil based finish.

Varnish

I include “urethanes” here as they are simply a high solid content varnish

Application

- To provide a non-porous barrier/coating
- Spirits based – may be applied over bare wood or dewaxed shellac or lacquer pre-coat/sealer, water based or spirits based products that you may have applied previously.
- Water based – may be applied over bare wood or dewaxed shellac or lacquer pre-coat/sealer or fully cured water based products you may have applied previously.

Waxes

Application

- To provide your preferred sheen and a surface that’s easily maintained to control finger marks and manage moisture. Waxes come in a variety of formulations and bases; beeswax (soft), carnauba (hard), blends of beeswax and carnauba to offer in between hardnesses, coloured waxes (typically black for antiquing), microcrystalline etc. All may be applied over bare wood, or any of the finish coats discussed here once they have fully cured. Applying wax too soon will prohibit the curing process of anything you’ve applied it over.

Oils

Application

- To quickly fill the pores of the wood and/or build a soft coating that will need to be replenished often to keep looking fresh and offering modest protection to the wood.
- Spirits based – linseed, tung etc.
- Natural based – walnut, canola, sunflower etc. I list ‘oils’ here last as its usually the only product you’ll be applying in lieu of any other finish or colouring. That said, fully cured spirits based oils (they take for ever to cure completely) may be topcoated with an oil based varnish and/or waxed while natural base oils may only be waxed with a natural wax i.e. beeswax, carnauba or a blend of these two.

Next time I’ll expand on this and tell you how I apply my colours, finishes, and waxes to get rich tones, contrasting figure and satisfying sheen using only gloss finishing products.

Websites re: products noted above

<http://www.woodessence.com/Dry-Shellac-P54C13.aspx>

<http://www.shellac.net/ShellacFlake.html>

http://www.promega.com/pnotes/71/7807_18/7807_18.html (Transfast)

<https://www.woodessence.com/Mixol-Pigments-C11.aspx>

http://www.mixol.de/front_content.php?idcat=1&lang=2&changelang=2

<http://www.rockler.com/product.cfm?page=10310> (Zinsser Sealcoat)

<http://www.targetcoatings.com/emtech-2000.html>

Fluids used to finish your turning projects Mark Salusbury

Water and Colour and Sealer, Oh My

Water is pretty cool stuff and valuable all through the turning process. It’s a coolant, a lubricant, a softener, an expansion agent and a base for pigments and topcoats.

Distilled water is the only stuff to use. Water from other sources will contain metals and chemicals that may stain or alter your wood in ways you don’t want. You can buy jugs of distilled water at any grocery store for a couple of bucks (it’s also best for steam irons and steam curlers I’m told). Keep a spray bottle of distilled water beside the lathe. When sanding and/or sheer scraping ornery grain, a light spritz of water on the offending area softens the wood, raises the fibres and cools the surface. Waiting for it to dry before continuing sanding also gives us time to inspect the piece in progress, critically or appreciatively. We can see the piece better at this point in time, after turning and before finishing, and make open minded changes in our process or creative path or confirm our course of action to achieve the best for piece.

Either way, please wait for the piece to dry thoroughly or you’ll wind up with a sanding disc or scraper too clogged with slurry to do any cutting!! By keeping the spritzing light, not saturating and using a hair drier with no heat or compressed air

it won't take more than a minute or so until you're back to refining.

I could dye for a touch of colour.

Once your piece is off the lathe, if you feel dye would enhance the figure or add to the piece through toning or colouring, a water based dye is an excellent choice. I use Dylon fabric dyes myself, available most anywhere fabric is sold, simply mixing the dye with warm distilled water per the instructions. I also like G&S Dyes (See references)

But first.

Before applying the dye solution, moisten the surface of the piece overall, let it dry thoroughly then lightly sand it back by hand with the last grit you used on the lathe (240 or finer) to raise the fibres and remove the fuzz.

This is a good step to take if you're just going to skip straight to applying a water based topcoat too. If you skip this step, the dye solution will raise the grain and you'll have to re-dye the piece after scuff sanding the first.

Getting back to your dye. Your dye solution will mix to about a liter of dye at full strength. I recommend you pour out a small amount of this strength and dilute it 50%, 30%, 20% or whatever you want and apply a swash of these reduced solutions to a sample board in the same cut, colour and species as the piece you're working with to see how it looks once it's dry, noting on each swatch the solution strength. A cheap hand hair drier set on "low" will help your pace. You can always add more dye in the same or higher strength to deepen the affect you want. Going the other way to reduce the effect is possible but way more work than adding colour bit by bit!

Your piece is calling and it has a question.

So now you've spritzed your piece, dried it, sanded it lightly and tested your chosen dye solution on a sample board. Now it's decision time apply your dye solution to bare wood or moisten the wood first to resist absorption? More dye will be absorbed by the exposed endgrain surfaces than other areas, making them prone to becoming more deeply coloured. Woods with irregular undulating grain such as cherry and pine may appear "blotchy" if dyed overall, while others like figured maple which is more uniformly figured may benefit dramatically, the dye solution causing the figure to "pop", turning a nice piece of wood into a real eye catcher.

Spritz first or forever hold your piece.

If you want a gentler colour effect, rather than applying dye to dry wood, add it to wet wood. Just before you apply dye, remoisten the wood with distilled water to fill the endgrain pores; thoroughly wet but not dripping. As you apply the dye solution to the moistened surface, you'll find its effect non the wood is uniform over the entire surface because you filled the endgrain pores with water first. Consequently, the water/dye mix will penetrate the woods fibres equally. The result will be a subtle coloration; a less dramatic emphasis on the woods grain and a more natural end result. Blotch prone woods will benefit from this approach. Give it a kick or add punch. If instead, you let the woods surface dry after scuff sanding and apply the water/dye solution to thirsty fibres, you'll find more colour is absorbed by the 'open' endgrain surfaces and less by the 'closed' side grain areas. The colour will be more pronounced and the piece totally transformed instantly and forever.

Like Momma told you, "Everything in moderation"! Remember to only apply water to the surface of the wood, don't saturate the wood deeply and avoid the temptation to apply too much colour all at once, working with nature not dominating it. Dyed wood will look bland when it's dry but will become much more vibrant once you apply your sealing top coats and wax.

Are you going to hit the sealing?...

Let your dyed surface dry totally, overnight or longer, before sealing it in with any topcoat. The base in any waterborne topcoat will reactivate under dried dye, causing it to dissolve and lift out of the wood pores. Alternately, an oil based topcoat will not adhere properly (oil and water don't mix) and the water in the dye will take a long time to evaporate through the loose fitting topcoat skin. But we're talking about water related stuff here so lets stay pure, shall we?

Put on a topcoat, I feel a cool draft.

driven by California legislation, water based varnishes and paints are taking over the world. Soon you'll find it very difficult to buy "oil" or mineral spirits based varnishes and urethanes anywhere. Water and alcohol are taking over. (Hmmm I've always like a bit of water in my alcohol). As byproducts of this initiative, selection is getting broader and the products getting better. Most of the notable tradition "finish" manufacturers (the folks that make topcoats not manufacturers from Finland) are offering water based products today. If you choose wisely, follow the manufacturer's instructions as closely as you can and let all applications of any water based product or solution dry thoroughly before applying another coat of anything, you'll be just fine Grasshopper.

Get "retarded"

Oh yeah water is not the best way to thin to thin water based topcoats. By adding water to top coats all you're doing is dispersing the molecules rather than dissolving them, effectively weakening the finish and that's all. To extend your working time with the product and/or increase penetration into the woods pores, buy the "retarder" additive designed to work with

your finish. This will preserve the finishes chemical properties, ensuring a good finish on your work. Very affordable very effective.

Pretty slick eh?...

So now you have your gleaming piece coated in two or three (at most) deft applications of topcoat. While you can certainly do a final scuff sanding dry, water's a great lubricant and cutting fluid for final sanding. Spritzed on the surface you're going to refine, you can now sand the surface very, very gently overall to remove any tiny imperfections (runs, drips, fingerprints and the inevitable dust specks) in your final topcoat application. The water allows your abrasive to cut more efficiently and at the same time provides a microscopic film between the abrasive and the surface of the topcoat to temper the abrasive action. I use 1000 grit paper or higher if I'm going to this stage and a very light touch, avoiding all edges and details where I know I'll easily and mistakenly sand through the topcoat to bare wood.

Remove the slurry completely with water dampened lint free clothes or a sponge and water. To get into the detail areas, a spritz of water and a soft brush with short bristles and/or a short blast of compressed air works well. I've even been known to take a piece I know is fully sealed to the sink and rinse it clean under running tap water. Then, wiping your piece down with dry clothes will perfect the surface in preparation for wax applied with 0000 oil free steel wool for a natural appearing semi-gloss result or wax and a cotton buff for a gloss surface so gleaming it'll "knock your socks off". A shoe shine brush works well too in some cases.

Popping a shiner

Water deftly applied during waxing is even possible, just like we'd do to bring up a shine on a pair of favorite boots or "Sunday best" Buster Browns; 'cept we called it "spit polishing" and for good reason.

Shellac from start to finish pardon the pun.

I'll admit to knowing very little about shellac generally but I know what works for me and why so I'll pass that along, leaving you to explore other shellac products if you care to. Basically, shellac is an alcohol based solution of dried flakes created from resinous secretions of a tiny insect, *Lacifer lacca*, indigenous to India and Thailand. There's an excellent article on the harvesting and making process in *Fine Woodworking*, December 2010, issue 215 for those that want some background.

Dewaxing poetic

While in its simplest form shellac incorporates a wax, I use the 'dewaxed' form for everything I do. This form is suitable for use under any other fluid or finish; the wax in the natural product resists other finishing products and solutions.

Shellac in its natural form, with the wax, is what's used as a topcoat and often "French polished" to a rich sheen. It's available in a variety of shades from blonde through dark amber making it a very adaptable type of finish, suitable to most wood species. You can easily make dewaxed shellac from the natural flakes by mixing a solution and letting it sit until all the wax settles out, then pouring off the wax free top portion. It can also be made from "wax free" flakes that have already been processed for immediate use.

I use the third method, a convenient Zinsser product called "Bullseye Sealcoat". It's a very light coloured premixed solution that alters the natural tone of any wood very little. It's handy as it's already mixed to a "three pound cut" (3 lbs. of flakes dissolved in a gallon of denatured alcohol) which can be used full strength as a topcoat or diluted to be used as a sealing solution.

As a 'wash coat' I cut "Sealcoat" about 25 % by pouring a small amount into a wide mouthed jar or plastic tub with a snap on lid and adding methyl hydrate (available in any paint store or department) to suit. What I'm aiming for is a thin fluid to use as a wash coat to seal the endgrain pores of my wood so they'll accept stain or topcoat to the same extent as the sidegrain. Where I used water as a "resist" before dye, I use a wash coat of dewaxed shellac as a resist before stain or any subsequent topcoat.

As a 'sanding sealer'

If I'm making a sanding sealer, I'll reduce the Sealcoat only about 10% which will aid in penetration into the woods pores yet keep a bit of body (solids) for sanding and grain filling. Subsequently, once fully dried and sanded lightly to my satisfaction, I'm ready to apply a topcoat; either more Sealcoat at full strength or any other finish I'd prefer.

There are some cool benefits to this approach. Once fully dry (overnight usually), the shellac is a 'sanding sealer' that raises and stiffens the woods grain and acts as a dry lubricant for scuff sanding the surface to smoothness. It seals the woods pores as mentioned, so any stain or finish will dry uniformly, ending blotchiness. Sealing and sanding to this level, goes a long way toward removing any sanding scratches missed earlier in our haste to complete the piece. Finally, you'll use less stain or finish from here on in with the added 'plus' that drying times will shorten too!!! Now you can 'glaze' with stain or apply any finish of your choice as dewaxed shellac is compatible with any water or oil based finish, epoxy or lacquer.

Websites re: products noted above

<http://www.gsdye.com/>

<http://www.woodessence.com/Dry0Shellac0P54C13.aspx>
<http://www.shellac.net/ShellacFlake.html>
http://www.promega.com/pnotes/71/7807_18/7807_18.html (Transfast)
<https://www.woodessence.com/Mixol0Pigments0C11.aspx>
http://www.mixol.de/front_content.php?idcat=1&lang=2&changelang=2
<http://www.rockler.com/product.cfm?page=10310> (Zinsser Sealcoat)
<http://www.targetcoatings.com/emtech02000.html> (water based varnish)
<http://www.getpainting.com/> (Dynamic Paintware sells Sealcoat in Canada)

How I Achieve An Effective Varnish Finish by Mark Salusbury

Varnish (includes urethane) is my choice of finish. It is easy to apply, durable, chemical resistant, may be applied in a variety of ways to suit the user, may be modified with mineral spirits, naphtha and or boiled linseed oil to achieve differing working properties and in most cases is non-toxic (food safe) once dried.

Recommendation: choose a brand of varnish that works well for you, is cost effective and readily available and use it as your 'finish of choice'; experiment with that one finish and modify it to your satisfaction. Avoid working with several kinds of finishes or you'll never get to know how to apply any of them well. For example, I use General Finishes 'Salad Bowl Finish' as my primary varnish and base for most of my modified solutions. As a secondary product I use General Finishes 'Arm-R-Seal', a urethane from the same source where I need a thicker product for greater durability. Both can be used interchangeably and modified in the same ways.

Sanding method discussed is power sanding by lathe/drill followed by hand sanding.

- 1.To begin a good finish use keen tools and cut the wood cleanly, smoothly and effectively.
- 2.Dress your grind stone; make sure it is clean, flat and 'open' to put a keen edge on your tools.
- 3.Use the correct turning speed to get an effective cut; neither too slow nor too fast.
- 4.Use a steady, controlled approach, action and follow through when cutting and/or sheer-scraping.
- 5.Sheer-scrape to refine shapes and remove any imperfect prior tool work.
- 6.Use fresh, sharp sanding abrasives; worn abrasives are wasteful and destructive.
- 7.Use an effective sanding speed, generally slower than your turning speed. Don't skip grits (80, 120, 180, 240, 320, 400 is my suggestion)

Optional but suggested:

1. Use a lubricant that works with your final finish to soften the wood fibres for a more effective cut during sheer/scraping and sanding and promote longer tool/abrasive life. Experiment with a light application of WD-40, boiled linseed oil thinned with mineral spirits, light mineral oil or water at 80 thru 180 grits.
2. Reverse grain rotation between grits to cut the fibres cleanly from both sides.
3. Reduce lathe speed as you increase grit number (i.e. slower rpm for 180 grit than 120 and slower again for 240 grit) for a more effective cutting action and to change the swirl pattern.
4. Increase lathe speed for the final pass of the final grit to 'buff' or turn lathe off and disengage drive belt and power sand using the drill to drive the process then hand sand over all with finest grit.

Varnish...Really Filling The Holes

Make sure you have good ventilation and/or a carbon filter mask and vinyl or nitrile gloves. Varnish and urethane are both durable finishes that build well on the surface of your work piece. They do not 'weep' like tung oil finishes and are easy to modify with thinners and/or oils to tailor its working properties to suit your needs. Choose a product whose manufacturers claims and methods of application suit your circumstances and needs. Use the product straight from the can following the manufacturers directions then try modifying to see how the product works altered.

1. Apply the first coat of varnish uncut (no thinning) liberally with a brush or disposable brush made from folded paper towel (fold into quarters then fold the quarter into thirds).
2. Let sit to absorb for about 5 minutes then wipe overall with paper towel and put aside to dry. If you wipe it 'dry' you can probably recoat in the same way in two hours. If you leave a visible film on the surface you'll want to let it dry for 4-6 hours

before recoating.

3. Repeat steps 1 and 2. Let dry thoroughly.

4. Repeat steps 1 and 2. Let dry thoroughly.

5. Rub piece down with 0000 oil-less steel wool (wash regular steel wool with lacquer thinner to remove manufacturing oils) then blow (compressed air) or vacuum the piece using a clean brush to agitate the surface to remove all traces of steel wool fibres

6. Repeat steps 1 and 2 wiping piece 'dry' (no film left visibly anywhere on the surface). Let dry overnight. You should now have a finished piece that is smooth and nub-free. If it still looks 'dry' and/or showing sanding marks etc, repeat steps 5 and 6. Now you can apply wax to further refine and protect if appropriate. Wax may be applied with 0000 steel wool or a paper towel depending on whether you want a 'soft' or 'hard' gloss surface. A carnauba/beeswax blend is my best suggestion or a liquid satin wax is less durable but produces a soft natural sheen 'out of the bottle' (or you can get a satin finish by wiping carnauba/beeswax, once set, with 0000 steel wool).

Recommended finishing products:

1. General 'Salad Bowl Finish', General 'Armour-R-Seal' (Woodchuckers), Zinsser 'Quick-15 (for its clarity and rapid setup time) (paint specialty shops).

2. Oil-free 0000 steel wool (Lee Valley (53Z08.05))

3. 'Bounty' brand paper towels (absorbent, lint free, excellent applicator and wiper, follows contours and gets into details well to remove excess finish effectively)

4. Vinyl gloves (Lee Valley) (editor's note: Nitrile gloves – Woodchuckers & Busy Bee Tools)

Modification Suggestions:

1. Mineral spirits cuts varnish and extends working time. Cut no more than 10-20%

2. Naphtha cuts varnish and shortens drying time. Cut no more than 10%

3. For an oil type wiping varnish: 1/3rd boiled linseed oil, 1/3rd varnish, 1/3rd mineral spirits or for less oil 4 oz. boiled linseed oil, 8 oz. varnish, 5 oz. mineral spirits. (Fine Wood-working issue 144, pp. 106-108)

Other recommended reading re: suggestions for food safe finishes are discussed in Fine Woodworking issue 129, pp. 66-69.

This article is also available at

Fluids Used To Finish Your Turning Projects – Lacquers

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So far, in this ongoing series about fluids for finishing I've covered my experiences with water and shellac, their values and applications and how colour can be mixed into your finishing process via these two fluids.

In this installment I'd like to tell you a bit about how I've used lacquer to my advantage. But first beware

To begin, I'll admit I have limited working experience with lacquer so don't expect a thesis on the differences between pre-catalyzed and post-catalyzed versions. I've no idea, leaving the door open to anyone else to chime in on this topic anytime soon.

I lac it a lot

Lacquer shares a few features with shellac. They share the 'lac' element. Like shellac, lacquer is a good sealer over bare wood or water borne dyes which have been given adequate time to dry completely. Like shellac, it's also fine for building a clear, durable finish but unlike shellac its film is colourless and is less prone to yellowing over time. Also like shellac, lacquer makes a fine base coat under oil (mineral spirits) based finishes. However unlike shellac, lacquer cannot be applied over oil based finishes.

While lacquer can be purchased in liters and larger containers for spraying with power equipment, from a practical point of view for our needs as woodturner, I'm aware of two main types of lacquer; "rattle-can" spray bombs and wiping lacquer.

"All shook up"

The rattle-can variety is thinned with lacquer thinners to allow it to be pressurized and sprayed, using compressed butane, isobutene or propane, from the nozzle of the can, remaining in a liquid state while air-borne and upon contact, then quickly drying to a (hopefully) perfect film. Because it is thinned, it makes a great sealer:

- its non grain raising
- can be applied very thinly

- penetrates (is absorbed) well by the bare wood
- sets up quickly
- is colorless so applies no amber hue to your work
- can be over-coated with more of itself or any other finish
- is non-toxic once the carriers and propellants have evaporated

On the negative side:

-it's smelly, noxious, flammable and messy; but these downsides can be easily accommodated. I'll tell you how.

Do it where???

When I spray lacquer I like to do it in an area where there is no air movement, the ambient air temperature is neither cold nor hot and where overspray can be dealt with. Ideally, outdoors on a warm, calm day and plenty of indirect light to see my progress by. Alternately, I spray in an area indoors where there is no air movement, airborne dust is at a minimum, I have plenty of light to work by and drop clothes or newsprint can be spread out to catch overspray.

Okay Keep it clean

A small spray booth of sorts made of a large cardboard box is a cheap way of containing spray. For most projects a box measuring 24" x 24" give-or-take is great. Cut it up so the "booth" consists of the square bottom supporting two adjacent sides. Cut this way the box yields two such "booths". Newsprint spread on the bottom and beyond the booths footprint will catch all the overspray and the two vertical "walls" behind the spraying area will contain the spread.

Alternately, there are plenty of ideas for making a simple yet effective spray booth on the internet; just do a search for "home made spray booth" and go to the host of images available for that subject. Here's one that features downdraft exhaust, probably a pleated paper furnace filter beneath the peg board bottom and vacuum created by a shop-vac.

Make it easy on yourself

A 12" "Lazy Susan" bearing, available from Lee Valley Tools among others, capped top and bottom with 15" diameter plywood discs makes a hefty, stable turntable. It is one of the best investments I've ever made in my finishing process. Centered in the finishing area, with the piece I'm spraying centered on top (after putting a square of newsprint underneath what I'm spraying to protect the turntable, I can stand in one spot where light, access to the work piece and overspray protection are maximized and while spraying the work, rotate the piece with my free hand to get at all surfaces.

"Painters Pyramids" also available from Lee Valley Tools among others, are invaluable in my finishing area. A piece being sprayed or finished in any method can be elevated above the work surface on three or more 'Paint ers Pyramids' resulting in maximum access to the surface I'm finishing and minimum contact area to buff out once the finish is dry.

Two step perfection

Because spray lacquer is so fast drying, Rather than spraying the entire piece in one pass and risking unmanageable rushing, sagging or blotching, I find it best to spray the bottom surface of a piece in progress first, let it dry to the touch, then flip the piece over and spray the upper surface, avoiding spraying the "Painters Pyramids" whenever I can. Because lacquer is self-leveling and self-blending, where the top and bottom surfaces overlap, the spray will blend with and adhere to itself without having to scuff-sand the previously coated area. If I'm just sealing the piece, one uniform spray is all it gets; all done in an hour and ready for the next step.

The "Skinny" on thin

When spraying lacquer, as with most finishes, I like to think of applying it in "veneers" rather than "coats" which seems like such a heavy term to me. Several thin veneers = 1 coat but each veneer dries faster, cures deeper, is far less likely to run or sag and is much more controllable i.e. it won't get thick and heavy looking unless you make it that way deliberately.

If I'm building to achieve a thick film, I'll apply two or three very thin "veneers", let that dry thoroughly, overnight or longer depending on the warmth and humidity of the air, then very lightly sand with 800 grit or higher just to get rid of any dust nibs, then spray a final thin application overall. Once totally dry and cured to hardness, it's ready for buffing for gloss or "0000" oil-free steel wool (Lee Valley) for a reduced sheen.

Don't "gloss" over this part

I always use "gloss" lacquer. This applies to my use of varnishes and urethanes too, always "gloss". The dulling agent added to gloss lacquer to make it "satin" or "semi-gloss" makes the finish murky, detracting from the clarity of the finish and your ability to see the woods grain and figure beneath. When I want to tone down the sheen of the finish I buff it out with one abrasive or another. Abrasives include oil-free steel wool, bronze wool, "Scotch-Brite" type material which comes in several degrees of abrasion, cotton rag, crumpled craft paper and automotive buffing compounds. Used individually or in combination I can control the level of sheen plus be able to localize the sheen on the piece. For instance, a vessel form with a high sheen outside and a dull sheen within or a platter form with a natural looking sheen on the rim and a glossy interior or vice-versa. Using only "gloss" lacquer gives me (and you) that flexibility.

Through thick and thin

“Brushing lacquer” which can be applied by pad too, has a greater solids content per volume than spray lacquer so it will build to a thicker coat, faster. Because it’s expected that the user will be interacting with the finish longer while brushing or wiping to achieve a uniform surface, retarders are in the chemistry to allow for greater working time and time for the product to self-level. Pen makers, bottle stopper turners and others making finished items right off the lathe will enjoy this type of lacquer as it dries quickly due to the added friction and air movement when applied to an item on the lathe. Just make sure the item is void-free and has no rough or natural edges.

These can get pretty gloppy looking as they trap and fling surplus finish. There’s also the real danger of the pad or brush being grabbed by the roughness, making a real mess and possibly a dangerous accident happening.

For application at the lathe I suggest padding on lacquer with a square of folded “Bounty” paper towel. One full sheet cut in four and folded in half then half again will work fine as an applicator. Pour as much lacquer as you think you’ll need for one application into a shallow, wide mouthed dish (think chaffing dish or small cat food can), dip half of your pad into the fluid, then with an underhand movement, hold it briefly to the piece revolving slowly on the lathe while keeping the pad moving. Practice will tell you if you’re applying too much lacquer or pressure or if your lathe rpm is too fast or slow.

If I find I need a thinner consistency for any reason, lacquer can be thinned with lacquer thinner which is generally available in liter or multi-liter cans to suit my needs and budget. Usually a 10% dilution by volume is enough, any more and it kind of defeats the purpose. Unless of course I’ve made a big mess and need to dissolve / remove the finish and/or clean up brushes or spills (“Murphy’s Law says that’s sure to happen”).

Now take care of yourself, okay?...

Which brings me to general safety when playing with lacquer and indeed most finishes. I’m constantly aware that I need to protect my eyes, skin and breathing and that fire and explosion are a real probability if I don’t plan for it.

Goggles or a clear face shield will protect eyes and/or glasses in the very real event that spray or lathe-flung finishing material gets onto my face. It’s happened to me and I’m guessing it’ll happen to you so I recommend wearing something appropriate to “block that shot”.

Nitrile (typically blue) gloves are the best for working with lacquer; they’re available, affordable and effective.

Vinyl gloves fall apart quickly in the presence of lacquer solvents and many of us have allergies to latex so we won’t consider them as an option which is just as well as latex doesn’t work well in a shop environment from my experience. Gloves provide important protection from overspray or liquefied lacquer when it’s being brushed or wiped on, keeping skin from absorbing toxins from the solvents and from getting severely and instantly dried out skin, nails and cuticles.

Who was that masked man?...

If I can’t get outside to do my lacquering, I wear a mask made to filter for inorganics. These have a small canister or two that separate and absorb the fumes and toxins in the solvents from the air we breathe, keeping our lungs, sinuses and nasal passages from drying out and/or getting coated with airborne lacquer particles. If I don’t have a proper mask, for short exposures, a close-fitting dust mask is a safe bet that will at least block airborne overspray particles. I only have one set of breathing faculties and I like them “flesh tone” not “hard gloss” coated.

Stinks and sparks

For the fumes always make sure there’s a gentle volume of air movement, preferably from an outside window; cross ventilation is even better. Lacquer and its fumes are flammable and potentially explosive in the right volume so needless to say keep away from open flames and spark sources like a woodstove or furnace or even an ashtray with a smoldering stogie. Even with a mask, your lungs will thank you for that same ventilation.

Next issue I’ll tackle other stuff thinned by lacquer thinners my favourites.