

FINISHING

Finishing Options for Woodturners



Finish brings an element of visual interest and protection to your woodturning. Many times wood- turners fall into one of two categories when it comes to finishing: (i) “McFinish Users,”¹ and “Miracle Finishers.” McFinish Users put the same finish on everything, no matter the type of wood, the purpose of the piece, or any other variable. They have one finish which they have found to work, and they stick to it no matter the circumstance. Miracle Finishers think that some company makes something that they can apply to any piece of wood, no matter how poorly sanded, and it will miraculously look perfect.

¹ I mean no disrespect to McDonald’s Corporation, and instead I pay them a compliment on product consistency.

Choosing a proper finish is no accident, but with a little thought you can achieve a finish that works. So let’s look at some factors to achieving a good finish on some woodturned items.

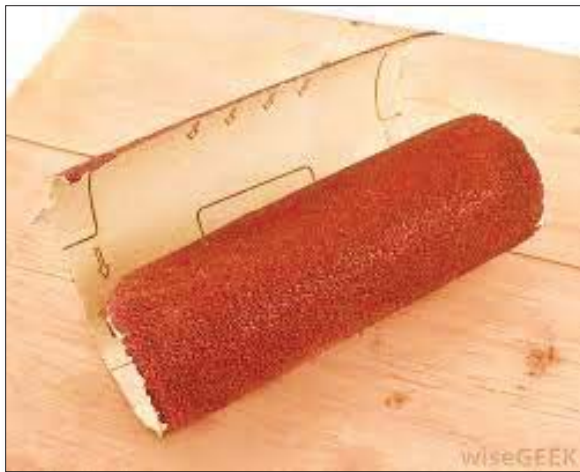
IMPACT OF WOOD SPECIES, DESIGN, AND USE

The type of wood² you choose for your turning project will open and close doors to finishing options. Open-grain woods (oak and ash) respond differently than closed-grain woods (cherry and maple). Highly figured wood and burls will absorb and react to finish differently within the same blank. Some oily woods (rosewood and lignum) may need no finish at all due to the natural oils they contain. If you are using a wood species new to you, take a scrap and try a finish on it before you turn it, so you can take what you learn from the test and apply it to your work.

Design also impacts finish choices. Some designs that require multiple chucking may limit or prevent you from using certain finish options. For example, if you are finishing the inside of a lid, your ability to reverse chuck it to turn the outside without damaging the finish may be a problem with some types of finishes. So think through finishing early on in the design of the piece. Also think about whether or not the finish “matches” the design. An organic shape may not look right in glossy polyurethane varnish. Use is often overlooked in the consideration of finish choices by some woodturners. If something is going to sit on a shelf, the world is your oyster and

² I am not addressing non-wood materials such as acrylics in this article.

you can choose any finish (or no finish at all).³ If I am making a utilitarian piece that will be knocked around the kitchen, a simple, repairable, utilitarian finish is my first choice, and I will pick a “forgiving” wood to make the piece from so that the finish and the wood help me get years of service. For example, the zebrawood peppermill that we use in our kitchen looks as good today as when it came into the house from the shop 3 years ago. It has a very simple design with no sharp ridges (to collect dirt or body oils). It was sanded to an 800 grit and given a simple oil and wax finish.



THE NAUGHTY WORD – “SANDING” AND ITS ROLE

I must stand up for sanding. I do not know why it gets such a bad rap in the woodworking world! Why is sanding “bad” and hogging out a rough-turned bowl “good”? From roughing through finishing you are involved in a process. Sanding makes or breaks the end result and should be part of the process. Sanding cannot cover up poor design or execution,

³ Although you may want to consider dusting and UV protection qualities.

but it can take a good piece and make it better, if done correctly.

Think about details before you sand. I often leave out small grooves and areas until the overall sanding is done. Then I add the small details (wire-burned grooves, for example) and then go back and blend in that area with the highest grit I left off with before I proceed to the next step. There is no rule that you cannot return to some detail turning after you have sanded. Go back and forth as the piece needs.

Turn down your lathe speed while you sand. If your paper is getting hot, it is either old or you are sanding too fast. Use dust-extraction equipment and wear a high-quality dust mask⁴ at all times while sanding. Watch the dust flowing off the piece into the dust collector. When the dust slows down, the paper is no longer cutting efficiently.

On the topic of sandpaper, it is cheap⁵ and it gets dull, so change out the paper more frequently. Rarely do you throw away “good” paper; usually you burnish the wood with dull paper and only generate heat and problems. If you have good tool control and if the wood is being

⁴ Cheap dust masks usually have one strap, where better ones have two straps. It isn’t a universal truism, but it will point you in a better direction. This is not a place to save money. Store dust masks in a plastic bag when they are -+++++---not being used and throw them away when they look dirty. Learn about dust and protecting your health.

⁵ I am not suggesting that all sandpaper is cheap, just in the grander scheme of what you pay during a year in wood working; sandpaper is not the biggest expense item. I am a proponent of purchasing “expensive” brand name paper (for example, ever hear of a little local company called 3m?) and have never been let down by high quality product.

understanding and forgiving, you may avoid the lower-grit papers. Start where you need to, depending on the situation. If you start with 120, then progress without skipping a grit until you reach your final sanding grit (120, 150, 180, 220, 320, 400...). Depending on use and finish, you may stop at 320, or I may go to 800⁶. Daily use knock-around pieces rarely benefit after 220 (other than using 320 and then a non-abrasive pad as a burnisher). A show piece may require a minimum of 800 grit, or even more!

On the topic of sanding disks, they get dull fast. Depending on the type of wood and composition of the disk, they may have a life measured in seconds! If you think I am kidding, hold a piece of 220-grit paper up to cocobolo! If the disk is building up with dust and debris, either clean it or change it out, but do not bear down on the paper with your drill on high speed and think you are doing something positive.⁷

I always burnish with a non-woven, non-abrasive pad (kitchen scrubbers from the dollar store work as well as the expensive commercial ones I used to buy). I find they smooth out any last “fuzz” in the piece and give a uniform surface for finish.

Now I must mention another ugly fact – not all sanding can be done on wood spinning on a lathe! Sometimes you must take it off the chuck and hand-sand it to get it right. Put on some good music, relax, and do it when you feel like putting the time into the work. I have a demo piece by a nationally renowned turner that I received unfinished. It took 10 hours of hand-sanding to get the piece ready for

finishing. So buck up, and know that sometimes you just need to put in the work.

A CLEAN SHOP MAKES A BETTER FINISH

I recognize that there is a certain sense by some woodworkers and woodturners that a messy shop is a rite of passage in the craft. Setting that aside, take a lesson from professional cabinet shops and have a clean finishing area. If dust is hanging from lights and other surfaces, it will contaminate some types of finish and give you a poorer result. So if you want a messy shop, pick finishes that do not require longer drying times or do not collect dust as they dry.

Setting tidiness aside, having a finishing area in your shop is a good thing. Store finishes in a safe location to prevent fires. Keep your supplies in an organized area so that you can find them when needed. A side benefit of organization is that you will buy less as items will not get lost in the general abyss of the shop! Watch the life of products and properly dispose of old finishes. Yes, a big can is cheaper per ounce; however, will you use it during its shelf life? Avoid the temptation to use an old finish on something that you have crafted. More than once I have had to sand it all off and start over.

⁶ Well, I have gone to 12,000, but let’s not talk about my obsessive behavior!

⁷ As I boy scout I was taught to start a fire by rubbing two sticks together over some kindling. See any similarities?

FINISHES ON THE LATHE

The lathe is a very versatile tool and lends itself to a broad spectrum of on-the-lathe finishing techniques. As most on-the-lathe techniques are designed to be fast drying, the size of the piece that can be finished on a lathe is generally limited to smaller items (pens, bottle stoppers, very small bowls, and other items generally less than 3 inches in diameter and modest in length.⁸)



Finishes used on the lathe seem to fall into the following categories:

- Highly sanded and buffed pieces with no finish at all.⁹
- A dedicated “woodturners finish.”¹⁰
- Oil.
- Oil and wax.
- Wax on bare wood.

⁸ I am sure someone has done a 12” CA-finished bowl and can prove me wrong; however, as a general rule you can only get the finish on so fast with these techniques before the CA starts drying and impacting finish performance.

⁹ Some woods have a high natural resin content that allows them to be sanded to a high gloss and buffed out to great results. Some man-made products such as Dymondwood® also achieve the same result.

¹⁰ For example, General Finishes makes a water-based woodturners finish that dries fairly quickly (30 minutes per coat) and has no odors. It takes a little longer than lacquer- or shellac-based finishes but if you want a low odor and durable finish, it seems very hard after application.

- Wax and abrasives in a mixture.
- Shellac-based finishes.
- Lacquer-based finishes.
- Paint pens.¹¹
- CA-glue finishes.¹²
- Some combination of the above.

On-the-lathe finishes are fast, provide great results, can result in a phenomenal shine, and provide instant gratification to the turner, so what is not to like! I find some woods respond well to them as do certain types of work (there is no better way to finish a pen or a bottle stopper). However, they have their limits.

Here are some tips:

- Use only paper towels to apply on-the-lathe finishes. Cloth fibers can wrap around a spinning lathe, creating a dangerous situation.
- Cover your lathe bed, ways, and anything else you care about, as spinning wood can throw the finish all over the shop.
- Use slow speeds for application and speed up the lathe for buffing and polishing.
- Use sanding sealer (either water, lacquer, or shellac base) before you apply finish.
- Work from one end of the piece to the other and push or flow the finish across the piece. That way you get a

¹¹ These work for embellishments or small objects, but are not really a viable finish for large areas. Some people use ink markers, but again they are of limited use other than enhancing chatter work or a simple groove.

¹² “CA” is the abbreviation for “cyanoacrylate” or the active ingredient in Super Glue, a registered trademark of the Super Glue Corporation, who holds various trademarks on its products.

more even finish and give your finish a path to avoid build-up in the middle.¹³

- Stop the lathe and check your progress. Fix problems as they are spotted (even if it means going back to re-turning an area or, heaven forbid, sanding!
- Finish the ends after you part it off and do any manual touch-up.
- Wear proper personal protective equipment and understand that a dust mask is not safe for protecting you from finish vapors.
- Be careful if you spray finishes on the lathe, as they “gum up the works.”¹⁴

FINISHES OFF THE LATHE

The world is your oyster¹⁵ when you finish off of the lathe! You can use any type of finish (other than a CA or “friction” finish designed to be applied on the lathe) on your work. If there is a problem with off-the-lathe finishes, it is that the options are so numerous and staggering that one can become confused and therefore just grab a finish and hope, rather than plan, for success.

I break down finishes into categories, but there are many approaches. If you like a finish category, refine your thinking within the category. If you have had trouble, try a different category and maybe your result will get better. Beauty is in the

eye of the beholder.¹⁶ Some people like to feel wood in their hands, and want the tactile warmth of the wood. Others like the shine of a car hood and want maximum gloss. Some want reparability. Others seek environmental friendly or “green” alternatives. All are fine. Figure out where you want to go and then move in that direction. Some options include:

- Nothing--sanded, bare wood is nice to hold.
- Wax (or colored wax) on bare wood.
- Oil family of finishes (tung, danish oil, walnut, mineral, linseed, Tru Oil (gun finish), other oil blends).
- Water-based finishes for wood turners.
- Polyurethanes (vary in types, sheens, thicknesses, and drying times).
- Lacquers (either clear [various sheens] or colored)
- Shellac (premixed, flake, and various levels of color from clear to amber).
- Milk paint¹⁷.
- The home brews (ink, vinegar and steel wool, and a whole host of blends of various finishes).

¹³ I find this technique particularly effective with Hut wax sticks and you can actually watch the wax flow across the piece.

¹⁴ This phrase’s origin is a reference to the sweet gum tree (or red gum tree) located in the eastern United States. Apparently children and early American settlers chewed the sap as we do sticks of gum. However, it was supposedly impossible to harvest the gum without creating a very sticky mess. Hence the phrase we now enjoy today.

¹⁵ Thank you to Shakespeare for bringing this phrase to our lives.

¹⁶ Or the judge or the person parting with their cash to buy what you are selling.

¹⁷ Milk paint is a fascinating finish and I suggest you try it. It comes as a dry powder so it has an indefinite shelf life. You mix only what you need and it is extremely durable when dry. It has no odor and it comes in a wide array of colors.



I blend my own wiping varnish using a fairly typical blend that has many variants and names. It goes as follows:

First Coat :

- 1/3 Fast Dry Polyurethane (Gloss)¹⁸
 - 1/3 Boiled Linseed Oil
 - 1/3 Mineral Spirits
- (Please note I mix only what I will use for that first coat so the quantities are small.)

Middle Coat(s)

- 2/3 Fast Dry Polyurethane
- 1/3 Mineral Spirits

Final Coat¹⁹

- 1/2 Fast Dry Polyurethane
- 1/2 Mineral Spirits

¹⁸ You cannot increase the gloss of semi-gloss or flat finishes as they contain dulling additives. You can decrease the sheen of gloss at the end so I always use only gloss finishes.

¹⁹ Prior to my last coat I sand with 400 or 600 grit serrate paper and wipe the whole piece down carefully, avoiding skin oils and other contaminates. The last coat is thinned to just fill in those final sanding scratches. It also dries faster due to the higher vehicle content so I get less surface dust attraction. This coat is usually put on late at night or early in the morning when the shop is still and I am not stirring up dust in the air.

FOOD SAFE?

I am now embarking on one of the most controversial areas of finishing. So let's start at the end of the analysis--common sense should prevail. People are not dropping dead in mass from finish on dinnerware. The Centers for Disease Control has no outstanding dinnerware alerts due to the malevolent action of woodturners. In fact, dinnerware on a global level is often not washed, or if washed, not in potable water. Those people seem to live. So, if we apply common sense, if a modern finish is applied to wood and allowed to fully cure you will be fine.²⁰

Most of the dialog seems to focus on cure time. I have read two ideas that seem to make sense to me. When in doubt, wait a month after finishing a piece before you put food in it. Any modern finish that is fresh, properly applied according to directions, and has not failed in some way will be cured in 30 days. The second test is the smell test. When you smell the piece, if you smell finish you are really smelling the vehicle evaporating from the finish. So if it smells, it hasn't fully cured. That is what curing is, getting the vehicle out.

²⁰ I am not advocating putting helpings of polyurethane in your coffee, or shellac in your tea. The quantities of vehicle that could be left after 30 days in a cereal-bowl-size piece are so small that it will not be harmful to a full-grown adult. Sure be safe with toddlers and kids, I wouldn't let them chew on a bowl, but need I write this comment down, or have we lost the common sense rule?

Some finishes seem to be more frequently mentioned as food safe and they include:

- Leaving the wood bare.
- “Salad Bowl” finishes (which seem to be polyurethane-based if my nose is working right).²¹
- Walnut oil, mineral oil,²² butcher block oil, and some of the other “food safe” oils. Avoid salad oil, olive oil, or cooking oils, as the general consensus seems to be they can go rancid in wood.
- Fully cured polyurethane, shellac, Danish oil, and lacquer.²³

COLOR AND BEYOND

I must profess that I am new to coloring wood and some would say it goes against my grain.²⁴ Normally I look for wood with great grain and leave well enough alone. Lately I have been experimenting with color and find it has its place in my turning toolbox. Color comes in many forms from paint, milk paint, dye, stain, charring, bleach,²⁵ and lacquer. Play around and see if it works for you. Remember to wear personal protection equipment (eyes, gloves, and an apron). Otherwise you will look like a Smirf.

²¹ For example, General Finishes “Salad Bowl Finish” states to wait at least 72 hours after the last coat before use. I have used this finish on several occasions with good luck, and find that it does create a pleasing finish.

²² Why did my great grandmother make me swallow a tablespoon of this when my stomach was upset?

²³ I wouldn’t eat out of something covered in latex paint, but that is just me.

²⁴ Sheldon is my humor coach, ah ah!

²⁵ Wood-bleaching products remove color but I lump them in here.

WHEN SOMETHING GOES WRONG²⁶

Yes, things go wrong, and with finishing woodturnings, it will happen. You are between finishing problems, not through with them. Hopefully they happen less frequently and the reparability of the problem is more easily accomplished if you sort through this approach to problem solving.

Here are areas to use in diagnosing what went wrong with your finish:

- **Old finish.** If there is a first place to look, it is cruddy, crusty, out-of-date finish. Here is a tip-- buy smaller cans and use it up. I believe there is false economy in purchasing vats of finish and having it sit around for years.²⁷ I buy the smallest size that meets my needs for the next 30-60 days. That may mean I buy a pint or quart of something four times a year. So stop, buy a latte, purchase new finish, and be happy. Finish has a shelf life that starts ticking at the time of manufacture, not when you buy it. If the can is dusty, do not buy the can. I cannot read date codes on finish, so I buy from sources that turn the product frequently and I do not stock up on finish, even if it is on sale. In magic marker mark the date on the can when you brought it home and use it up (you can always finish your jigs if you are getting near the bottom of the can).²⁸

²⁶ I am a husband, father of two children, and a guy; yes, I admit things do go wrong.

²⁷ Tip: the same holds true for glue, but alas, I am getting off topic, a frequent problem.

²⁸ Always properly dispose of old finish. Don’t get lazy, do it for your children and grandchildren.

- **Contaminants in the can.** You are not supposed to dip a brush (or applicator) into a can and apply finish from an original can. Pour finish into another container and do not return the unused portion to the original can. If you see junk in the can, strain it or properly dispose of it, but do not use it on your fine work.
- **Environmental problems such as temperature and humidity.** When you buy a can of finish, it is not like gasoline--there is no summer blend or winter blend.²⁹ So the manufacturer is forced to make a compromise in what they sell. That is why you must evaluate if you use finish as mixed by the manufacturer or thin it (or add something else to it) based on your application. Some days where I live it is too humid to spray lacquer without “blush” occurring in the finish. So wait until the humidity drops. Similarly, if a finish has a minimum temperature recommendation, do not put on a coat of poly in a shop that is 42 degrees! Use common sense and pay attention to temperature and humidity factors.³⁰
- **Insufficient drying time.** Ever read that little label on a can of finish? There is a section called “Drying Time,” catchy name! Ironically if a finish takes 2-4 hours to dry, it doesn’t always like to have the second coat put on in twenty minutes because you are in a hurry. Most finishes are made up of two major components, the part

you want to leave on the wood (think of the solid part) and the “vehicle” (oil, water, alcohol, or something else that allows the finish to be a liquid and to spread). The vehicle needs to evaporate before the finish is really dry. By the way, dry to the touch and dry is not the same thing. Most finishes dry from the outside in, so there may be a dry skim coat on top and wet finish below. That is why the manufacturers define drying time as something other than “if you want to smear on another coat, go ahead.”

- **Environmental contaminates.** Dust, bugs, and certain chemicals (such as silicone) are not your friend when you finish. If your finish isn’t smooth, it’s probably a result of either dust or bad technique. If you have specks in the finish, look for contaminants in your finish or bugs.³¹ Round circles of unfinished wood are usually caused by silicone contamination, commonly referred to as “fish eyes.”
- **Incompatible finishes.** If you are layering on finishes by using for example (i) a sanding sealer, then a top finish; or (ii) an on-the-lathe finish and then something after it comes off, and something goes wrong with the second finish-- look at finish incompatibility. I have had finishes get “gummy,” pull away from the base finish, crack, become an alligator skin, and never seem to dry. In short, it can happen. When it does, read about the finishes you used and find out why it happened so you know for next time.

²⁹ Did you know your gas is blended differently throughout the year and has different amounts of something or other in it depending on the time of year to help your car run better?

³⁰ I am no chemist, but it seems as finish ages it becomes more susceptible to environmental factors.

³¹ Seriously, I just sprayed a coat of lacquer as I was writing this paragraph and laminated a mosquito into a tool handle, ugh!

- **Bad technique.** I know, I know, your technique is perfect, but hear me out. If your finish fails and you have eliminated all of the above, maybe, just maybe, you have to look in the mirror. Seriously, too much finish in one coat (trying to do one heavy coat in place of several proper coats), too much oil in one coat,³² using dirty applicators (lint³³, dust, and dirt transfer), using the wrong finish for the situation, using the wrong applicator, not maintaining a “wet” edge, not reading the product instructions, improper mixing or application, all can result in failure.

Whenever you have a finish failure, walk away for a minute, say those few choice words,³⁴ then diagnose the problem, get to the bottom of it, and find a solution so that it isn’t a recurring event.

~ Mark Palma
Cameron, WI

Mark Palma is a tax lawyer by day and a woodworker whenever he finds that “spare” time that isn’t spoken for. He thanks his family for allowing him to have a shop, a tool allowance, wood stash, and the time to pursue his addictive hobby.

³² Often called “bleeding” results in finish coming to the surface in open grain woods for days or weeks.

³³ Of course, if you are using a cloth instead of paper towels, you are finishing off the lathe and never on the lathe. Safety Reminder #1 --never use a cloth on a spinning lathe. Safety Reminder #2 -- always properly dispose of applicators and solvents. Charring wood should be intentional, not part of a conflagration that consumes your shop.

³⁴ I grew up in a strict Catholic family so that resulted in a trip to the confessional for some Our Father’s and Hail Mary’s, but use your own tension-release mechanism of choice. The point is to get past being mad and start to diagnose the problem.

WHERE TO TURN FOR WOODTURNING

Selected readings from *American Woodturner*, journal of the American Association of Woodturners

Getting Started in Woodturning



1. Safety for Woodturners
2. Lathes and Turning Tools
3. Learning at the Lathe
4. Practical Woodturning Projects

Elements of Woodturning

1. Turning Holiday Ornaments
2. Making and Using Turning Tools
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