
FINISHES FOR WOODTURNERS

My Favorite Finishes for Wood- From Utility Objects to Art

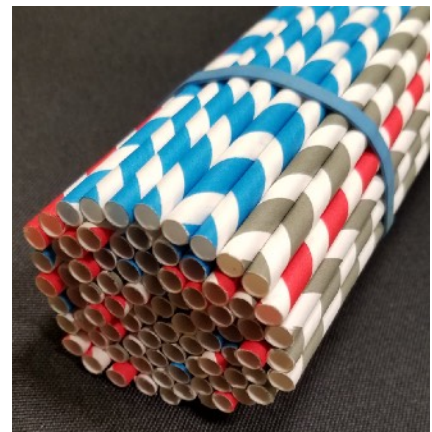
Finishing is its own art form. Devoting time to exploring new techniques, combinations and products can be viewed as an investment in elevating your work or a source of great overwhelm and frustration. While there are some standard go-to finishes that span a wide range of application, the specific finish you choose for any given piece will depend on its desired effect and intended use. Adopting just a handful of techniques to accommodate the style/s of your work will provide a solid platform for expressing your



creative voice! While my understanding is limited to personal research and experience, this resource shares some basics to equip you with finishing techniques and product information worthy of your resources and creative exploration. The way we prepare the surface is equally important to which finish we choose, so considerable portion of this resource will be focused on understanding the why and how of the preparation leading up to applying a finish. I have included a chart of the types and brands of my current favorite finishes, please know that it is intended as a brief overview, as there are volumes of books to be found about each subtopic I visit in the text that follows.

Wood.

To understand finishes, we must first understand the material we plan to finish. If we are primarily wood-workers, then we must have at least a *basic* understanding of wood. At the most primary level, wood is a bundle of straws. Wood can be described as straws with sidewalls and open ends. How these straws are oriented and contorted determines the figure within a block of wood. The way they are cut, crushed or abraded drastically affects the way the wood accepts or rejects a finish. If the straws have been cleanly cut, or sliced, a finish can amplify the characteristics of the wood, grain, figure and all. If the straws



have been crushed, the finish will absorb unevenly and appear fuzzy and blotchy, enhancing the damage inflicted on the wood fibers. If the straws are abraded, such as when the surface has been scratched in a series of progressively finer abrasive grits, the finish will highlight the soft, fuzzy surface... even if only visible on a nearly microscopic scale. Sometimes a finely abraded surface is desired, such as when painting. The fine texture actually gives the paint a surface to which it can interlock. Other times, the cleanly sliced fibers are desirable, as the wood's character is highlighted with an unmatched optical clarity. When a sliced surface is skillfully paired with a penetrating finish, light permeates the surface and creates a beautifully warm glow that brings the work to life.



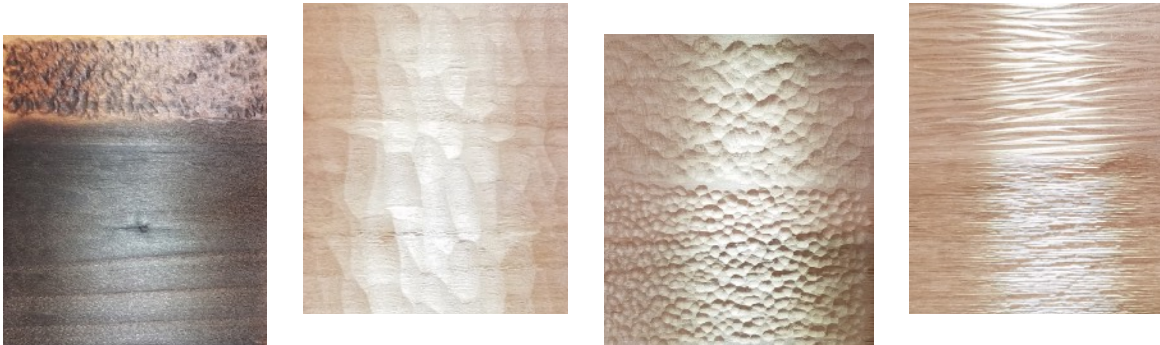
Considering wood as a bundle of straws, the ends of each (end grain) are hollow tubes, absorbing light and soaking up finish through capillary action. The sides of the straws (side grain) are the structural walls of the tubes, reflecting light and limiting the absorption of finish to the gaps between the straws. When applying a penetrating finish such as oils, the end grain appears darker and the side grain lighter. The chatoyance, or three-dimensional reflective quality of the side grain becomes even more contrasting when finishing. This can create a beautifully dramatic contrast in how the lights plays off the surface, known as chatoyance.

This is what makes figure such as quilt and ripple so desirable in the world of woodworking. Sometimes the contrast between side grain and end grain isn't as attractive. In a plainly figured piece of wood, the contrast can appear as though two different colors of finish have been used... as if there was an unintentional mistake in the finishing process. With practice and intention, wood selection and positioning can either be used to highlight or mute the contrast between these two grain orientations. Specific finishes can also be used to minimize or mute the contrast between end and side grain.

Texture.

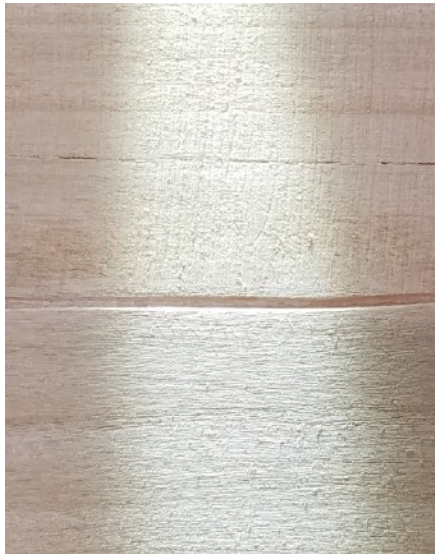
Surface texture, or lack-of, can add to the overall appeal of a piece. A textured surface can communicate a level of refinement, or even of rustic-ness, depending on the layout and contrast between the high and low points. Texture will never cover up for poorly planned form, however textures can distract from an otherwise well executed form. Refine the form and surface, then explore textures using a scrap wood (of the same species and grain orientation) before applying to your piece. It is worth noting that most textures will apply differently on side grain than end grain, explore and carefully examine your choice.

My favorite basic embellishing textures include torched, burnished, faceted, stippled, striated and textile patterns. The use of one or more textures in a single piece or body of work can convey a message of cohesiveness or be used to establish contrast. As with anything, experiment, explore, and notice before applying to a prize piece. By becoming a student of technique, the most basic applications evolve into artist expression.



Shadow.

Use a light to read even the finest texture, including the scratches left behind from abrasives.



Position the light level with and to the side of the surface you want to “read”. Turn off the other light sources, so there is only one source of light, will cast a single hard shadow on the trailing side of every feature that stands proud of a surrounding surface. In this way, the leading side of a feature is highlighted with light and the shadow on the trailing side offers great contrast... in essence, magnifying the texture and making it easier for your eye to perceive. The best light to use is a single source light, so there is a hard light which creates a crisp contrast. As seen in the accompanying photo, the scratch pattern of 180 grit abrasives can easily be seen shining a single light source across the surface. If using a multi-source or diffused light, the contrast between highlight and shadow will appear to soften and become more difficult to detect.

Abrasives.

When sanding flat-stock, my favorite technique is to finish each grit sanding WITH the grain. This blends the scratch pattern in with the natural texture of the wood grain before progressing to the next progressively finer grit. Before starting with the next grit, always blow, wipe or vacuum the surface to ensure any shed abrasive particles are removed... otherwise you will discover in the middle (or end) of sanding that there are a few deep scratches that seemed to appear out of nowhere! AAAaaaarrggggghhhhh!!!!



When this happens, you will need to go back to the

beginning of your sanding progression and start over to re-establish a uniform scratch pattern... before aligning the scratches with the grain, cleaning the surface and working through the progression of grits once again. This is a frustrating lesson, especially when you don't know why or how it happens. This unfortunate series of events begins with a few larger grits shedding from the abrasive substrate, becoming temporarily embedded in the wood, only to work their way out and onto the surface when you are sanding with the finer grits. Once on the surface, the larger grits are dragged across the surface to leave their trace, a frustratingly noticeable trench! While seeming to lengthen your finishing routine, adopting a practice of wiping, blowing or vacuuming the surface between grits will actually save you time and lots of frustration. While the problem of shed grit presents itself anytime abrasives are used, sanding in the round presents a new challenge, a scratch pattern that crosses the grain at some location on the surface.

By the nature of the lathe, woodturners typically work in the round. Which means that aligning the scratch pattern with the grain can be somewhat difficult. When sanding on the lathe, I use two methods to address the issue; finishing each grit 90 degrees to the circumference (along the radius of the piece) and creating a uniform circular scratch pattern. The first technique allows me to see when I have completely eliminated scratches from the previous grit, effectively alternating with sanding along the circumference and then sanding across the scratch pattern at 90 degrees. I use this technique to work through the grits, until the scratch pattern becomes unobtrusive or will be filled with a finish created surface film.



The second technique of creating a uniform circular pattern can be accomplished using several methods; by hand, using a passive rotary sander, powered rotary sander, or powered random orbital sander. Each of these methods work to create curved scratch lines/ swirls, which distract your eye where overlapping with neighboring swirls. The crossing of lines works to break the highlight-shadow relationship, the finer the overlapping swirl pattern, the more diffusion of reflected light, the more uniform the surface appears. Each method excels in specific applications, but my overall favorite for blending the scratch pattern into a soft, consistent surface is the random orbital sander. My favorite tool for this is a pneumatic random orbital sander made by Grex.

The general rule, "You get what you pay for." definitely holds true for purchasing abrasives. Think of your next sandpaper purchase as an INVESTMENT in quality and efficiency in reaching your desired level of sanded surface. Quality abrasives have several attributes worth noting for woodworkers; grits are more carefully screened for consistency, which produces a much more even scratch pattern. The higher quality abrasives also use better backing material, adhesive for retaining the abrasive substrate to the backing, which both equate to longer wearing life. Once you have settled on your abrasive of choice, stick with the same brand to ensure a predictable graduation through

grits. My favorites brands are Mirka, Uneda (*Ekamant*), Klingspore, 3M and Norton. While more expensive, I purchase flexible cloth-backed abrasives whenever possible, as they last longer and can be folded without shedding of grit along the crease.

Wet-Sanding.

I use wet-sanding techniques in two applications; When turning a thin-walled piece from very wet wood, completing the form entirely while wet, and when working with dry wood to create a color-matched grain filler.

My favorite wet-sanding technique is sanding with water as the “wetting” agent. I actually add a few drops of liquid dish soap to the water, to aid in lubrication, to slow the evaporative process and to help float any abrasive grit that sheds during the process. I use this technique when turning a wet piece, in a single session to completion, especially from figured or burl Madrone. Madrone is very evenly dense and closed grain. These particular qualities factor greatly in the success of this technique, as the abrasive grit will shed during the process of wet-sanding and would otherwise become lodged in the softer or open grains of other woods. Another characteristic that makes Madrone perfect for this technique is that the drying process creates a huge amount of movement which accents the grain and figure beautifully. The expression of grain and figure results in a beautiful three-dimensional pattern, which would be erased if sanded once dry. To preserve the wood’s expression, the only way to sand the surface to a uniformly satin sheen is before the wood loses too much moisture, even better is while the piece is sopping wet. Because sanding of the wet wood creates a slurry of wet wood “paste” which loads the abrasive to the point of rendering it useless, using slightly soapy water as a lubricant allows the slurry to dissipate and unloads the abrasive to allow the grit to work the surface.

The other way I use wet-sanding is when I want to create a grain-filler to smooth out the surface and prepare for a glassy finish. In this technique, I apply the first coat of oil finish, allowing it to fully soak the wood. I allow it to soak for 10-15 minutes, then I re-wet the surface and lubricate the abrasive sheet with oil. Sanding in this way creates a colored slurry made of wood dust and oil, which gets pushed into the open grain to fill the voids. I sand through a progression of several grits, then lightly wipe the surface clean and allow the piece to dry overnight. Once dry overnight, I continue sanding with a grit or two lower than the one I ended with the previous session. In essence, the slurry of wood dust and oil finish fills the open grain and hardens. The advantages of using this technique to fill the grain; the filler is a great color match and the subsequent layers of finish bind to the “filler” with no compatibility issues. It should be noted that while this can be used to fill tearout, the end results always look like you filled it with a color-matched putty... resist the temptation to use this as a fix for poor surface preparation.

Grit.

“What grit do I begin sanding with?” and “What grit do I end with?” The answer to these questions remains amazingly undefined. While I have developed a strong intuition about what grit to start and end with through years of working with and finishing wood, prescribing a specific number for someone else to use seems overly generic. The first and most important factor in determining the starting grit, is the surface quality resulting from your final tooling of the surface. Is the surface cleanly cut and uniform in appearance or is there tear-out and damaged grain? My advice is to use what experience you have to guide your starting grit and pay close attention to whether the surface uniformly improves... pay particular attention to any patches where the grit you are using doesn't seem to be working. With improved tooling, your “starting” grit will shift. Most woodturners will



being sanding around 120-180 grit and will finish anywhere from 320 grit or higher, depending on the material they are working with and the intent of the piece. The harder and denser the grain structure, the more glaring even the smallest scratch marks are. If you turn a piece of Blackwood or Ebony, you will quickly gain an understanding that the denser and less distinct grain pattern, combined with uniform color makes this wood beautiful and unforgiving. It is not uncommon for someone who is working with ultra-dense exotic (like Blackwood and Ebony) or acrylic to polish the surface using abrasive sheets up to 12,000 grit or higher, followed by abrasive pastes and buffing wheels to attain a glass-like surface.

Finish.

Every woodturner seems to have their favorite finishes. For me, the end product dictates the choice of finish. If the piece is intended to be handled, then a finish which



tactilely communicates a soft, warm surface may serve best. Some turners like a surface coating like lacquer or urethane on their work and others are drawn to the feeling of wood grain that results with use of a



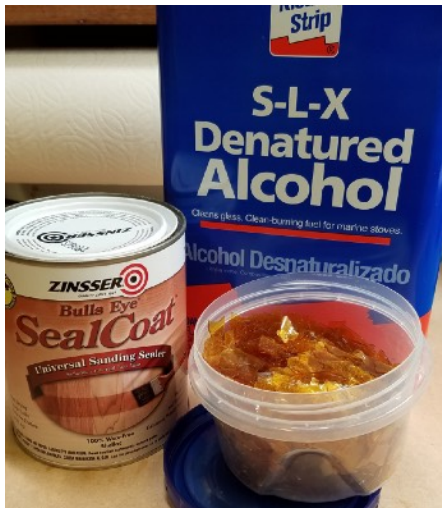
penetrating finish like a soft wax or oil. I like to play with different finishes, depending on the intent of each piece; some pieces receive several layers of dye, pigment, paint, sometimes even rubbed with a wiping varnish, while others are treated with a quick burnish using a handful of shavings and an oil-wax finish. There is no hard-fast rule to choosing the “right” finish for

a piece, just consider what your intent is for the piece and make the calculated decision of which finish best meets the criteria and go for it. The choice of finish is worthy of exploration as it holds the potential to either strongly amplify or distract from the overall intent of your work. Please refer to the table at the end of this resource for a chart of my favorite finishes, ranging from penetrating oils, polyurethane and varnishes and lacquers, to inks, acrylics and paints.



Sanding Sealer.

Sanding sealers can be used to harden the wood for sanding, or they can be used to mute the contrast between end and side grain's absorption of finish. Many woodworkers believe that sanding sealers are a mute point, arguing that if you are using a drying finish, the initial coat provides a "sanding sealer" once it has dried. I would agree with this approach. I often use the finish itself as this type of sanding sealer. However, the other use for a sanding sealer is where it really finds value in my finishing techniques. When I want to minimize the contrast between how end grain and side grain absorb a specific finish, I use a specific sanding sealer... more like a clear "primer" for under the chosen finish. My choice of sanding sealer, which is compatible with all the other finishes I regularly use, is *blond de-waxed shellac*. I make mine from flakes, which have an indefinite shelf life



in flake form and 6-12 months when dissolved in denatured alcohol (DNA). I mix my de-waxed shellac in about a 1lb. cut, meaning I would dissolve 1 pound of dried shellac into 1 gallon of DNA. Of course, I mix my batches in much smaller volumes, as needed. A smaller volume of "1lb. cut" can be made dissolving 1oz. Shellac flakes into 8oz. DNA. After making shellac from flakes for several years, I don't follow a specific recipe anymore. I mix an approximate "1lb. cut", then test it on a sample piece of wood. If the mixture is too thick, I add an appropriate volume of DNA... if it is too thin, I mark the volume of liquid on the side of the container before opening the lid for awhile to evaporate some DNA, effectively concentrating the "cut".

Blond shellac flakes can be purchased through your favorite woodworking supplier, I order mine through Lee Valley Woodworking Supply. Or, you can purchase Zinsser Sealcoat (de-waxed shellac), which comes as approximately a 2lb. cut, available at many hardware or woodworking supply stores. While the can specifies "do not dilute", so they can sell you more of the product. Sealcoat can easily and successfully be diluted to a 1lb. cut by mixing 1 part Sealcoat with 2/3 part DNA. I won't go into the math... I know, it doesn't seem right... I assure you, it works.

Homemade Finishes.

One of my favorite homemade all-around finishes I have used for years on my flatwork, carved work and turned work is really simple to make and uses commonly found ingredients found at your local hardware store. To make it, mix equal volumes oil based Spar Varnish (I prefer to use *satin* sheen for a softer appearance), Boiled Linseed Oil, and



Mineral Spirits into a metal or glass container. This wipe-on, wipe-off finish dries overnight, leaving the soft-satin sheen of a penetrating oil finish combined with a level of protection that makes it worthy of finishing heavily used furniture. This finish is easy to touch up, requiring no special attention or preparation, just a little light spot sanding and re-apply. Please note, as this ingredients use drying oils... ALL RAGS MUST BE DISPOSED OF PROPERLY! Read the directions on the ingredients. I spread my rags out to dry, until they are crispy, only then do I dispose of them. This finish also requires lots of ventilation and respiratory protection as it emits flammable VOCs... after about 24 hrs., the fumes will have dissipated. For these reasons, I now prefer to use other finishes that require far fewer precautionary measures and give an equally beautiful finish... the trade-off is price and availability. I am referring to my current favorite penetrating finish, Osmo Polyx- Satin.

If you are interested in making a friction polish, which I will not go into great length of discussion, the *OB Shine* recipe is a great one for smaller objects that will only see delicate handling. It works well for anything that you want to put a quick drying finish while building up the layers. You can make it by mixing equal parts shellac (waxed), boiled linseed oil and DNA. Once mixed, this finish separates in the bottle, so make sure to shake well before applying. Apply this finish to the wood, first with the lathe off and allow to soak in for a few moments. Then, reapply with the piece spinning, reapply a fresh coat and press your paper towel into the wood to create friction. Make sure to move your applicator back and forth across the wood, so you don't develop streaks as the finish begins to dry. Wait to cool, then repeat the friction application to build your desired layer of finish. I prefer to let any friction polish, such as this, set for a few minutes after cooling, to ensure the shellac has a chance to set.



Wax.

I find a few occasions where a wax finish is the finish of choice for the piece I am working on. When I DO use wax, it is the final finishing layer... typically on top of another finish. While I LOVE the smell of friction-warmed beeswax or carnauba wax melting into unfinished wood, I find that I rarely use them anymore. The decision to apply a finishing coat of wax is a oneway path, meaning once it is applied, there's no turning back. The only finish that I have found compatible with wax, once it has been applied, is an oil-solvent based finish. The compatibility is based on the solvent's ability to






chemically melt the wax and emulsify it into the freshly applied oil. While this “works”, the oil finish doesn’t seem to cure the same as without the wax. If I am going to wax a piece for shine and feel, I prefer to use a microcrystalline wax such as Renaissance Wax. Microcrystalline waxes can be applied with a very thin coating, which dries to a very fingerprint and water stain resistant protective



layer. If you are contemplating applying a final wax layer to your finish, just remember, “Once applied, you are stuck with it.”

Closing Thoughts.

Understanding wood and how to prepare it for a suitable finish will provide a foundation for the finish to accent everything that makes wood our chosen material to work. Whether it is the warmth of color, pattern of grain, chatoyance of figure, or the intuitive familiarity we have developed with wood over years of experience. My hope in sharing techniques, products and information about how to prep for, and apply an array of finishes helps you develop your own techniques and gain even more confidence in bringing your creative work to life.

Eric's Favorites	Favorite Application/ Brand	Characteristics	+Pros/ -Cons
<p>Walrus Oil- "Furniture Butter" (slow-hardening oil-wax)</p> 	<ul style="list-style-type: none"> • Woodenware/ Foodware • 100% foodgrade (plant based) • Natural & toasted or charred wood • Walrus Oil- Furniture Butter 	<ul style="list-style-type: none"> • Penetrating finish (oil/ wax) • Low sheen (matte to satin) • Wipe-on • Can be <i>wet-sand</i> applied • "Wipe-On, Wipe-Off" • 2+ coats recommended • 24-48hrs. Dry time • 1-4wks. Cure time (polymerizing oil) • \$\$ 	<ul style="list-style-type: none"> + NO VOCs + Easy/ forgiving application + Can be applied with rag, paper towel or abrasive pad + Easy to re-apply, no sanding +/- Soft finish +/- Must renew if used as "washable" finish + No crack, peel or flake
<p>Osmo Polyx-Oil (hardening plant oils & waxes)</p> 	<ul style="list-style-type: none"> • Woodenware (bowls) • Natural & charred woods • Seal inks, dyes & paints • High-wear pieces • "Hand-rubbed" finish • Satin is my current favorite! (Osmo Polyx-Oil 3043-Clear Satin) 	<ul style="list-style-type: none"> • Penetrating finish (oil/ wax) • Plant-based • Multiple sheens available • Wipe / brush / squeegee • Apply w/ non-abrasive pad or lint-free cloth • "Wipe-On, Wipe-Off" • 2 coats recommended • 8-10hrs. Dry time • 2wks. Cure time • \$\$\$\$ 	<ul style="list-style-type: none"> + LOW VOCs + Easy/ forgiving application + Can be applied with rag, paper towel or abrasive pad + Easy to re-apply, no sanding + Durable (floor finish) + No crack, peel or flake + Can be sanded wet to fill grain
<p>Polyurethane (synthetic polymers, plastic resin)</p> 	<ul style="list-style-type: none"> • Non-food items • Natural & charred wood • Seal inks, dyes & paints • High-wear pieces • Can replicate "hand-rubbed" • Apply with lint-free cloth, pad or brush • MinWax Wipe-On Poly (Satin) is my preferred 	<ul style="list-style-type: none"> • Penetrating + surface finish (oil+polyurethane) • Multiple sheens available • Wipe / brush / squeegee • Apply w/ lint-free cloth, pad or brush • "Wipe-On, Wipe-Off" • 2+ coats recommended • 4-8hrs. Dry time • 1+wks. Cure time • \$\$ 	<ul style="list-style-type: none"> - MED.-HIGH VOCs (use respiratory protection) + Easy/ forgiving application - Sanding may be required to re-apply (once dried) +/- Durable- plasticizes wood +/- Builds a surface film + Can be sanded wet to fill grain

Eric's Favorites	Favorite Application/ Brand	Characteristics	+Pros/ -Cons
<p>Aerosols: Lacquer, Artist Fixative, & Varnish (UV) (synthetic polymers, solvent based)</p> 	<ul style="list-style-type: none"> • Non-food items • Detailed, delicate, or textured surfaces • Tinted lacquer aerosols (Krylon ColorMaxx) can be carved through once dry • Clear fixatives (Krylon Fine Art Fixative OR Krylon Kamar Varnish) can provide protection in <i>stealth</i>, when applied as a thin coat • UV protection (Golden Archival Spray Varnish OR Krylon Fine Art Fixative) 	<ul style="list-style-type: none"> • Surface finish • Multiple sheens available • Spray • 2+ coats recommended • 15-60min. Dry time • 1+wks. Cure time • \$-\$\$ 	<ul style="list-style-type: none"> - HIGH VOCs (use respiratory protection) - Spray-booth or dust-free environment recommended + light application allows fine textures to show - matte sheens can look “dusty” if applied thick - Delicate + Thin coats can offer nearly undetectable protection - May crack, peel or flake if applied thick - Sensitive to humidity & moisture content (blushing)
<p>Inks: India ink (carbon based, water, alcohol, ammonia solvent) Acrylic Ink (acrylic resin binders, polymer emulsion)</p> 	<ul style="list-style-type: none"> • Non-food items • Detailed, delicate, or textured surfaces • Dramatic color effect • Speedball SuperBlack India Ink • Daler-Rowney FW Acrylic Artists' Ink 	<ul style="list-style-type: none"> • Penetrating color • Wipe, brush or spray • 2 coats recommended • 1-5min. Dry time • ~1hr. Cure time • \$-\$\$ 	<ul style="list-style-type: none"> - LOW/ MED. VOCs (India Inks- ammonia, use respirator if spraying or applying in large quantity) + NO VOCs (acrylic inks- water based, use respirator if spraying) + Color intensity + Lightfast/ “Archival” + Can be used to tint other H2O based mediums + Can be thinned w/ H2O + Can be applied with brush, sponge, rag or sprayed + Inert once dry
<p>Acrylic Paint (acrylic polymer, petroleum derived carrier)</p> 	<ul style="list-style-type: none"> • Non-food items • Dramatic color effect • Can be used to add 3-D texture • Can be used to dye wood or cover with non-transparent layer • Can be layered and then carved through once dry • Golden, Daniel Smith and Ranger Liquid Pearls are my preferred brands • SUPER VERSATILE!!! 	<ul style="list-style-type: none"> • Penetration depends on viscosity • Various viscosity avail. • Various sheen avail. • Various transparence avail. • Various lightfast avail. • Various textures avail. • Dry time varies • Cure time varies • Wipe, brush, sponge, squeegee, pour, trowel/ knife, spray, etc. 	<ul style="list-style-type: none"> + LOW/ NO VOCs (use a respirator if spraying) + Color intensity + Color selection + Versatility + Can be applied with brush, sponge, rag or sprayed + Shelf life + Can be used to tint other water-based mediums (ie. Milk Paint, PVA glues, epoxy) + H2O-Based + Can be thinned w/ H2O +/- Alcohol will dissolve dried acrylic

Eric's Favorites	Favorite Application/ Brand	Characteristics	+Pros/ -Cons
<p>Milk Paint (Old Fashioned Milk Paint)</p> <p>(milk casein, lime, water)</p>  	<ul style="list-style-type: none"> • Food-Safe • Can be used as “wash” or cover coat • Can be layered, then scuffed through to add dimension & emphasize texture • Can be burnished with paper bag, brush or smooth/polished rock for interesting effect • My preferred technique uses <i>Ultra-Bond</i> additive in the first coat to aid in adhesion • Old Fashioned Milk Paint OR The Real Milk Paint are my preferred brands • SUPER VERSATILE!!! 	<ul style="list-style-type: none"> • Mix 1:1 powder to warm water, thoroughly mix, then rest for ~15min. before application, strain for clumps (using cheesecloth) if smooth finish is desired • Matte/ chalky finish if left unsealed • Can be burnished to develop a sheen • Can be sealed with a protective finish (oil, poly, lacquer, varnish, etc) • Cure time varies on viscosity, temperature and humidity • 2+ coats recommended (allow to dry overnight before second coat, & again before sealing) 	<ul style="list-style-type: none"> + NO VOCs (use respiratory protection when mixing, due to dust) + Color intensity + Color selection + Durability + Versatility + Can be applied with brush, sponge, rag or sprayed + Avail. additives for effects + Shelf-life (powder form) - Shelf-life (liquid form) + H2O-Based + Can be thinned w/ H2O - Protective clear finish strongly recommended (this may change the color and make it look “wet”, test before applying)