

Selected **Finishing References and Notes** from my experience

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Somewhat revised July 2008 (some phone numbers, prices and products may not be up to date)

Finish references that were helpful for me:

Finishing Overview, by Alan W. Hollar, American Woodturner, June 1996, page 35-38.

Five ways to turn a silk purse into a sow's ear", by Alan W. Hollar, American Woodturner, December 1996, page 8-9. (Note: Mohawk bought out Star Finishing Products, and discontinued producing *Simulated Oil Finish*, #77. A similar effect can be achieved by removing part of the lacquer, $\frac{1}{3}$, from a gallon of flat before stirring so as to increase the concentration of stearates.)

Oil Finishes: Control through understanding, by Bob Flexner, American Woodturner, December 1995, pages 28-31.

Turning Thin and Finishing with Epoxy, by David Lory, Fine WoodWorking, July/August 1980, #23, page 60.

Selected finishes, sources and comments from my experience:

EPOXY AS HARDENER AND FILLER

Epoxy paint works well for hardening dry soft and spalted wood, primarily near the surface only in sound wood, except it will penetrate end grain for one-half inch or more. May take 2 or 3 applications for very decayed dry wood. Epoxy paint will not penetrate wet wood. Can be built-up over small holes, indentations, and cracks with subsequent applications every 30 minutes, and until the wood is no longer thirsty. Later sand to a smooth surface. If using a chuck for holding a bowl, leave base tendon intact for remounting to sand cured epoxy. Best to allow one week to cure before sanding, to avoid clogging sand paper. (Can speed cure or complete the cure by heating piece in an oven at low heat, 135°, for an hour or two - but not in a closed up house. Also can speed cure in a hot ventilated attic. However, first allow two days at room temperature for free epoxy in end-grain cells to solidify, or the expanded warm air in cells will push it out producing a bubbly-rough surface.)

Epoxy paint brings out the color you will get if the piece were oiled or lacquered, thus providing an opportunity to decide whether to finish the piece, or finish it for a different purpose or market. I use the epoxy paint as a sealer. If the piece is to be finished with oil, it will absorb less oil. If it is to be finished with a water based surface coating, I don't use a sanding sealer - which contributes to water based finishes being cloudy or muddy.

For applying epoxy paint, prepare foam pad on wood handle with a wire through foam and around handle (glue holding the foam together melts and plastic handles melt). Throw pad away when done. Keep a spare pad on hand in case you tear the foam off the wire. Observe safety precautions below.

Remember, epoxy is hazardous material. Use a good charcoal filter mask, eye cover, and nitrile latex industrial gloves for your protection!! Work in an exhaust hood or outdoors. Accumulated vapors are very explosive. Use cleaner plus vinegar for brush clean up, if not using throw away foam. Use vegetable oil and corn meal to clean your skin. Cure treated pieces for a week at 60F or above in a place that won't contaminate the air you and your family breathe. The need to work

outdoors and provide warmth for curing generally means winter is not the time to use epoxy paint.

Epoxy paint raises the grain just as water would do. Before applying a surface coating, I wet sand the wood, using citrus thinner or an oil. If an oil, it needs a week to cure, otherwise the lacquer will eventually fail to continue adhering to the surface.

Sources for epoxy:

1. P/C #100 CLEAR, Polyamide Epoxy Coating by Torginol Inc.. A two part clear epoxy paint, made for wood. Available in 2 gallon kits (\$90 for gallon of part A and B, and thinner-cleaner #711 at \$24/gal, plus shipping hazardous material of \$100 on 8 gallons). Minimum order, \$200. Storable for over 1 year. After mixing parts A and B, 30 minutes is needed to steep before using. Pot life is 12 hours.
<http://www.torginol.com/> (The #100 Clear is not shown on this site.)
Torginol Inc. 920-467-2471 1-800-558-7596 Can pay phone order by credit card.
710 Forest Ave., PO Box 102, Sheboygan Falls, WI 53085-0102
2. Several years ago, Marshall Jacobs had cans of Duron two part clear **Polyamide Epoxy Primer/Finish, Dura Clad, Industrial Coating**. The product numbers on those cans no longer apply (# 3304132, and 2677A Epoxy Reducer, clear, product #9301511). **Dura Clad 70 100% Solids Rust Penetrating Epoxy Primer, Clear**, #DU1T00700 for part A, and #DU1V00700 for part B, under Industrial Products, is probably the same product. Can be found at: www.duron.com/products/industrial_coatings/productinfo.asp?cat=5, and ordered on line for delivery to your local store, or directly to you (but delivery may be expensive since this is hazardous material).
3. West System has a slow cure epoxy. I have not tried it.
4. Do not attempt to use the Polyamide Epoxy Clear Sealer/Finish by Benjamin Moore & Co. It is very cloudy not clear, and it has a heavy dose of stearates that dull your tools instantly and it is very difficult to sand. Probably it is good for a concrete floor coating.

OTHER WOOD HARDENERS

1. "The Wood Fortifier", POLYCRYL concentrate can be diluted with water and applied to wet wood in successive applications of higher concentrations up to 50% dilution. Manufactured by PRESERVATION SOLUTIONS, 1060 Bunker Hill Road, Jefferson, ME 04348. 207-563-5414.
2. P.C. PETRIFIER "is a single component adhesive, formulated to fully penetrate and revitalize rotten wood." "...a water base wood consolidant with low VOC". Wood must be dry, and free of dust, dirt or grease, etc. (I have not yet tried this.) Manufactured by Protective Coating Co., Allentown, PA 18102-4922
3. I have been told that MinMax has a wood hardener. I have not tried it.

OIL FINISHES

1. Tung Oil, 100% Pure from Woodcraft. This is a heavy oil, somewhat difficult to spread. But works much better when thinned with citrus thinner (Bioshield Citrus Thinner, #23) and wet sanded with worn 600 wet/dry paper. Tung oil provides the most smooth and sensuous

surface of the oil finishes.

2. Behlen, Danish Oil, Natural, B700-1506. This is a polymerized penetrating oil that provides a nice oil finish after several applications. Contains petroleum distillates. Best to work with a charcoal filter mask together with an exhaust hood or work outdoors.
3. Non toxic oils such as *Primer Oil #1* and/or *Penetrating Sealer #5*.
Herbal Oil #2 for food service objects. (I have not tried this oil).
Bioshield Citrus Thinner, #23. Can be used as a lubricant for wet sanding hardened oil or a surface coating. (Also it is a handy solvent for use around the house and shop.)
Bioshield Paint Company
<http://www.bioshieldpaint.com/> 800-621-2591 orders
1365 Rufina Circle, Santa Fe, NM 87505 505-438-3448 FAX
4. Armor All on red cedar to hopefully prevent it from turning gray over time. With several applications, wet sanded the first time with worn 600 grit paper, results in a smooth, somewhat slippery finish. Can dull over time (one year), but is easily refreshed with another application of Armor All. Use disposable gloves and apply in an area apart from other wood work, so that other wood is not contaminated with Armor All.

SURFACE COATING

Generally my aesthetic is to achieve a smooth surface, such as a table top would have. To achieve this smooth surface, in addition to the spraying described below, additional steps will be required to fill holes created by insects or decay, or to fill cracks. After an epoxy paint treatment, I generally fill obvious holes and cracks with a mixture of two part epoxy glue and sanding dust of a wood appropriate to the color desired. Various shades of brown can be achieved by adding small amounts of Burnt Umber and Lamp Black (tubs by Grumbacher or Cotman water colors).

Once the first or second coat of finish is applied, additional holes or cracks may appear. When using nitrocellulose lacquer, I use a very small pointed brush to add material to fill the hole or void, either before or after starting the sanding process. If water based polyurethane, apply additional material with the brush within a few hours of spraying while the "burn-in" feature is still in effect.

My Method of Application

I have been using small cup touch up spray guns at about 35 pounds pressure. Large cups are harder to keep from hitting the piece, and become too heavy if near full and held high. I periodically spray on cardboard to check the spray pattern, and then adjust or clean the gun as needed. Generally I sit on a stool in front of a well lite table top spray booth, wearing a charcoal filter mask, and also goggles if spray bounce back is expected. I count on light reflected off of the sprayed surface to indicate if enough liquid is on the surface - otherwise it is a guess and feel for whether enough and not too much material is sprayed. If nitrocellulose lacquer looks rough from poor flow out, or cloudy from high humidity, a second gun loaded with lacquer thinner will generally take care of the problem.

There is a supply of unfinished bowls of various sizes turned about ½" thick that are used to hold a piece upside down for spraying the bottom. A couple of ¼" squares of double sided tape keep a finished piece from sliding off the support piece. A lazy susan is used to turn the upside down piece a half turn while spraying, or a whole turn if the piece is very small, while the gun is mostly

held in one place. After successive passes spraying each half side of the bottom or under side, the piece is turned 90° and another spray pass is completed on each half. I consider this one coat.

To spray the top of a piece or inside of a deep vessel or salad bowl, I hold the base in my left hand and do most of the movement with the gun in my right hand. If a puddle, from too much material, develops in the base, generally it can be removed with a fine brush. If there is just one run, it may be possible to lay the piece with the run down so that it flows out somewhat rather than concentrating as a run. The inside of bowls need air drainage to dry, which may mean special positioning with support props of wood or unfinished bowls.

While practice is the teacher, special attention is given to not spray too much material, causing a run. If I get a run with nitrocellulose, I generally leave it and sand it smooth when dry. If several runs occur with a water base finish, I can take the piece to the utility sink, wash it off, dry, and spray again. If just one run occurs, I may decide to sand it out later when dry.

Generally I spray two coats or more of nitrocellulose sanding sealer, sand smooth, spray one or two coats of gloss, sand, and then a top coat with very flat lacquer. If water base, then two coats of gloss, sand, then a flat top coat. If I sand through those first coats, then I spray again as it were the first time.

Pieces with wet nitrocellulose are placed on shelves outdoors for drying.

For water base finishes you should have a stainless steel gun, since any water corrodible parts will rust, etc. From my experience, it is very hard to get all the water base spray material to all dissolve from flushing. You will know that if little chunks come out some subsequent day when spraying.

Nitrocellulose Lacquer

Clear, "water white" (W.W.), nitrocellulose lacquers in gallon cans from Mohawk:

<u>Item No.</u>	<u>Description</u>
M610-1687	High solids W.W. clear sanding sealer
M610-0207	High solids W.W. clear gloss lacquer
M610-1007	Flat
M650-0107	Lacquer reducer

Mohawk Finishing Products, 4715 STHWY 30, Amsterdam, NY 12010-7417.

1-800-545-0047, Ext 2000. Register with them by requesting a customer number. May pay with VISA, MasterCard, or Am. Express.

Best to request catalog and price list, before placing order, in order to find other items to make a \$50 order - such as tack cloth, paper strainers, etc. (Fine mesh strainer from Duron paint stores is better and may cost less.)

Water based lacquer or polyurethan

For a sanded piece ready to apply finish: After a soaking application of epoxy paint (with no surface coat allowed to remain) is cured and wet sanded with oil or citrus thinner, I apply several coats of the gloss lacquer without first using a sanding sealer. Note: Due to cloudyness in the acrylic finish on some pieces, I have stopped using acrylic.

1. Oxford *Ultima Spray Lacquers*, 1000 Series, is “a water-based acrylic clear lacquer with burn-in and performance equal to solvent-based CAB and catalyzed lacquers”.
LAC1028 Gloss, gallon, \$38.70
LAC1728 Clear Flat (10° Sheen), gallon, \$38.70 (**The stearates cause this flat coat to appear cloudy.**)

Target Coatings, Inc, P.O. Box 1582, Rutherford, NJ 07070 800-752-9922
www.targetcoatings.com

2. Water based Enduro interior lacquers by Compliant Spray Systems. Available in one-quart starter kits that includes sanding sealer and your choice of top coat, and a 3M Fine and Very Fine sanding pad.

<u>Item No.</u>	<u>Description</u>	<u>Cost/gallon in CA</u> (also available in quarts)
WBSS-01	Clear Sanding Sealer	\$34.70
WBG-01	Clear Gloss	34.25
WBDF-01	Clear Dead Flat	36.25 (semi-gloss, satin & flat also available)
TGF-Q	Transparent Wood Grain Filler	\$14.50/QT

Order by phone, 800-696-0615, between 8AM-5PM PT but closed for lunch 11:AM-1PM.
For descriptions see www.compliantspraysystems.com Since these are water based shipped from California, order in the summer months, not in winter.

Poly Urethane - water based

1. For salad bowls and functional trays, the Oxford *EmTech U9300 Polycarbonate Urethanes*, which “is water-clear, non-yellowing, ... formulated as a final topcoat for high-end interiors, tabletops ... and offers excellent chemical resistance, weatherability and UV stability over dyed or stained substrates.” Build up without sanding between coats can be achieved with a minimum of 2 hours drying time and no more than 12 hours drying time between coats. (Source is Target Coatings, listed above.)
2. Water based clear Enduro Poly for interior or exterior use by Compliant Spray Systems. Available in one-quart starter kits that includes sanding sealer and your choice of top coat (gloss, semi-gloss, satin flat or dead flat), and a 3M Fine and Very Fine sanding pad for \$25. Requires sanding between coats.
Order by phone, 800-696-0615, between 8AM-5PM PT but closed for lunch 11:AM-1PM.
For descriptions see www.compliantspraysystems.com
I like their dead flat better than the flat Oxford EmTech U9300 Polycarbonate Urethane.

SANDING OR POLISHING A SURFACE COATING

Lacquer: With 320 or 400 wet/dry paper and water as a lubricant, aggressively work the sprayed surface to an even surface. To any indentations, small holes or cracks in nitrocellulose lacquer, apply more of the same lacquer (or sanding-sealer) to build up to an even surface.

Use water as a lubricant with 400 or 600 wet/dry paper to sand gloss lacquer smooth. If I sand through to wood, I later spray another coat. (Note: If you sand dry and not in a hood or outdoors, fine dust that you can't see settles everywhere!) Fold wet-dry paper over double sided tape to improve grip and life of paper. 3M FINE or SUPERFINE sanding pads with water as a

lubricant will produce about the same result as the wet/dry paper.

Use 12000 Micro-Mesh and water to lightly rub a flat lacquer top coat to remove the roughness of protruding stearates. Micro-Mesh is available in some catalogs and on line from numerous sources. Technical information available at:

https://www.micro-surface.com/default.cfm?page_id=200

Gloss lacquer aggressively rubbed with a 3M SUPERFINE pad (made in England) will bring up a flat finish nearly the same as a top coat of dead flat lacquer.

Epoxy coating: This is very laborious to hand sand. You need to apply coating evenly without runs or bubbles to minimize or avoid any need to sand. Possibly this can be done best by spraying, which I have not tried. (Caution - vaporized epoxy and solvent is very combustible.) If the bowl slowly turns while the epoxy is setting up, runs can be avoided. You can successfully sand cured epoxy on the lathe with wet-dry paper, using water as a lubricant.

Oil finish: Apply 3 or more coats of oil, wet sanding with worn 600 paper with each application. Use air hose to blow oil out of holes and bark edges. Also citrus thinner and tooth brush works well to remove excess oil from a bark surface.

SAFETY EQUIPMENT:

1. N-DEX Gloves. (Soft nitrile disposable gloves, 4 mils, Style #6005XL, fits sizes 10-11. Powdered is easiest to put on)
(Best has been one of the manufacturers, 1-800-241-0323)
(Low powder gloves are more difficult to put your hand into. First use baby powder on your hands.)
2. Nitrile Industrial Gloves (long cuffs)
(Manufacturer: NORTH Industrial Gloves, Nitrite Latex, 13 Mil or more, size 9 or 10.)
3. Wilson 6100 series half mask dual cartridge respirator (Other brands also available)

Items available from:

SAFEWARE INC.
3200 Hubbard Rd.
LANDOVER MD 20785-2005

<https://www.safewareinc.com/>
1-800-331-6707, 301-683-1234