

Finishing De-mythified

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The confusing array of finish choices—made worse by misleading or ambiguous labeling by manufacturers—means many of us find one finish we like and use it for every task and without much further consideration. While there isn't a single *best* finish, finishes vary widely in their ease of application, resistance to wear, water, and ease of maintenance. In this demonstration, fulltime turner and writer Don McIvor will help make order out of the many choices woodturners face when selecting a finish for a project. Don will provide insight into oil-based, water-based, CA finishes, and buffing, demonstrate some easy application techniques and tips, and show you how to make your own oil-based finishes.

Finish type	Definition
Wax	Beeswax, carnauba, paraffin, and a variety of synthetic waxes. Sometimes combined with solvents or other types of finishes to alter properties.
Oil	Derived from nuts, seeds, or crude oil. Wide variety of qualities depending on type. Can be divided into curing, semi-curing, and non-curing.
Thinned Oil	An oil mixed with solvent to improve working properties/curing.
Varnish	Made by mixing oil with natural or synthetic resin, followed by cooking. Varnish is neither oil or resin, but a new product in its own category.
Oil/Varnish Blend	Varnish blended with oil to improve working properties. (e.g., Minwax Antique Oil Finish or Tung Oil Finish, Deft or Watco Danish Oil Finish, Olympic Antique Oil Finish, Maloof Furniture Finish, J.E. Moser's Danish Oil).
Wiping Varnish	Varnish blended with solvent to improve working properties. (e.g., Ace Tung Oil Finish, Hope's Tung Oil Varnish, Formby's Tung Oil Finish, Old Master's Tung Oil Varnish, Waterlox Original Formula, Watco Wipe-on Poly, Valspar Val-Oil, General Finishes Salad Bowl Finish or Seal-A-Cell or Oil & Urethane Topcoat).
Polymerized Oil	A curing oil that has been heated in the absence of O ₂ to a partially cured state. (e.g., Sutherland Welles, Spirit Line)
Water-based (water borne)	Employs water as a carrier for acrylic or polyurethane resins.
Lacquer	Nitrocellulose based (usually), includes resin, plasticizer, and a brew of solvents.
Cyanoacrylate (CA)	Adhesive (aka Superglue) that can be built to a surface film.

At the end of every turning project, every woodturner faces the same question: *What finish should I use?* If there was one “best” finish, we would all be using it and we would never have to face that question again. Unfortunately, every finish has pros and cons, and therefore every decision is a compromise. Factors for turners to consider when choosing a finish include the following:

- Appearance
- Protection
- Durability
- Ease of application
- Safety
- Reversibility

Finish Qualities ¹							
	Wax	Oil-based	Shellac	Lacquer	Varnish	2-part	Water-base
Appearance							
Builds a film?	0 – 1	0 – 1	1 – 5	1 – 5	1 – 5	1 – 5	1 – 5
Clarity	4	4	3 – 5	5	4 – 5	4	3 – 4
Non-yellowing	5	1 – 3	1 – 4	3 – 4	1 – 2	4	5
Protection							
Water resistance	0 – 1	0 – 3	2	3	4	5	3
Water vapor resistance	0 – 1	0 – 1	5	3	4 – 5	5	3
Durability							
Wear resistance	0	0	3	3	4 – 5	5	4
Solvent/chemical resistance	0	3	1	2	4 – 5	5	2
Heat resistance	0	3	1	2	4 – 5	5	2
Ease of application							
Brush or cloth	3	5	3	1 – 3	1 – 5	1	3 – 4
Spray	3	5	4	5	4	4	4
Dust problems during appl./cure	5	5	4	4	0	3 – 4	3
Safety							
Personal health	5	3 – 5	4	2	3	0	4
Environmental safety	4 – 5	1 – 5	4	0	1	0	4
Food contact	--	--	--	--	--	--	--
Reversibility							
Repairing	5	5	4	4	1 – 2	0	3
Removing	4	3	5	5	2 – 3	0	4
0 = poor, 5 = best							

Finish type ¹	Pros	Cons	Cure	Tips
Wax	<ul style="list-style-type: none"> • Inexpensive, esp. if you make your own paste wax • Easy to apply and maintain • Quick to apply • Compatible with oily tropical hardwoods 	<ul style="list-style-type: none"> • Little protection from wear or water • Utility wear will require on-going maintenance. 	Doesn't cure, and remains relatively soft.	Buffed-on carnauba wax is a good go-to in this category.

¹ Modified from Flexner (2010).

Finish type¹	Pros	Cons	Cure	Tips
Oil	<ul style="list-style-type: none"> • Usually produces a warm, pleasing appearance • Easy to apply • Easy to repair/maintain • Can build to a good utility surface 	<ul style="list-style-type: none"> • Can reduce range of visible tones & “muddy” spalted wood • Can take many coats to achieve optimum properties 	<ul style="list-style-type: none"> • Softness varies by type; tho polymerized cures hard. 	<ul style="list-style-type: none"> • Wipe off excess. • ~6 coats tung oil for optimum protection.
Lacquer	<ul style="list-style-type: none"> • Can be built to remarkable depth • Easily repaired (tho not by non-woodworker) • Potentially excellent choice for decorative items. 	<ul style="list-style-type: none"> • Best application by spray (can or gun) = \$\$\$. • Solvents • Not suited for utility items 	<ul style="list-style-type: none"> • Rapid; multiple coats in short time frame. 	<ul style="list-style-type: none"> • Use ventilation/lung protection. • Rattle cans are a good option for occasional use.
Varnish	<ul style="list-style-type: none"> • Offers excellent protection against wear, water. • Can be built to good depth. • Can be manipulated for matte-to-glossy finish. 	<ul style="list-style-type: none"> • Repair is difficult, esp. for non-woodworker. • Slow curing makes dust a challenge. • Working properties are challenging. 	<ul style="list-style-type: none"> • Hard, but slow to cure. 	<ul style="list-style-type: none"> • Working qualities improve with thinning/blending. • Apply in a dust-free place.
Oil/varnish blend	<ul style="list-style-type: none"> • Easy to apply. • Forgiving in somewhat dusty conditions. • Pleasing look, with satin or semi-gloss appearance. • Works well w/burl, wood w/voids 	<ul style="list-style-type: none"> • Remains fairly soft due to oil content. • Moderate level of protection. 	<ul style="list-style-type: none"> • Soft and slow, usually satin. 	<ul style="list-style-type: none"> • Wipe off excess to avoid sticky/uneven finish.
Wiping varnish	<ul style="list-style-type: none"> • Offers good protection, especially if built up. • Easy to apply. 	<ul style="list-style-type: none"> • Usually builds to a glossy finish—not to everyone’s taste. • Can be susceptible to dust problems. • Built-up finish can be difficult to repair. 	<ul style="list-style-type: none"> • Hard and fairly fast, usually to gloss. 	<ul style="list-style-type: none"> • Leave each coat wet to achieve quick build.
Water-base	<ul style="list-style-type: none"> • Adds almost no color to wood 	<ul style="list-style-type: none"> • Film finish, so can be difficult to 	<ul style="list-style-type: none"> • Moderately hard and 	<ul style="list-style-type: none"> • Humidity, temp limits.

Finish type ¹	Pros	Cons	Cure	Tips
	(depending on formulation). <ul style="list-style-type: none"> Reasonably durable w/moderate water resistance. Soap & water clean-up. 	repair. <ul style="list-style-type: none"> Wood can look “blue” and lifeless, esp. dark timbers. Dust can be a problem. 	fast.	<ul style="list-style-type: none"> Correct applicator avoids bubbles. Bury dust nibs, sand 2nd-to-last coat. Sand cured finish before re-coat.
2-part	<ul style="list-style-type: none"> Best water resistance/proof option Tough, durable surface 	<ul style="list-style-type: none"> Challenging to apply well Uncured product is toxic; requires appropriate respirator, skin protection Thick application looks like plastic Expensive 	<ul style="list-style-type: none"> Moderately fast, very hard 	<ul style="list-style-type: none"> Use a high quality product. Those designed for boat building (e.g., West System 105) are engineered to adhere to wood. Coating the inside of a vessel & rotating it slowly (<100 rpm) on the lathe while the 2-part hardens can yield a fairly even surface.

Finish Formulas

Thinned Oil

1 part raw oil
1 part solvent

This is a great finish for treenware. With tung oil as a base I also use it on wood trim, floors, natural tile, and concrete countertops. It is versatile! The shelf life is at least six months, though I never keep it on hand that long.

Wiping Varnish

1 part varnish
1 part solvent

This product will behave like many of the commonly available wiping varnishes. You can vary the consistency as needed, but don't go below 10% or above 50% solvent. A higher percentage of varnish will build a finish more readily, but will also be more challenging to apply well.

Thinned Oil/Varnish Blend

1 part raw oil
1 part solvent
1 part satin or gloss varnish

This finish is easily applied with a shop towel, cloth, or varnish brush, and it readily builds a surface film. The oil/varnish ratio can be altered to change application qualities or build properties. My biggest challenges are keeping dust out of the finish before it cures, and the shelf life is short. I mix only what I can use in 24 hours.

Paste Wax

2oz (59ml) raw oil
0.07oz (2g) carnauba wax
0.6oz (17g) beeswax
2oz (59ml) solvent

This recipe requires heating flammable ingredients! Use low heat and a double-boiler, and do not leave the pot unattended. Gently heat the wax and oil in a sacrificial pot until the wax has melted, then remove from heat and stir in the solvent. Pour this mixture into a small, large-mouth container (a cosmetics jar works well) and let cool. The result is a paste that is easily applied with a shop rag. Varying the ratio of waxes to oil/ solvent changes the consistency of the product. Shelf life is about four months.

Additional Resources

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