

Wipe-On Finish Test

Many perform well,
but the winner
is the least
expensive

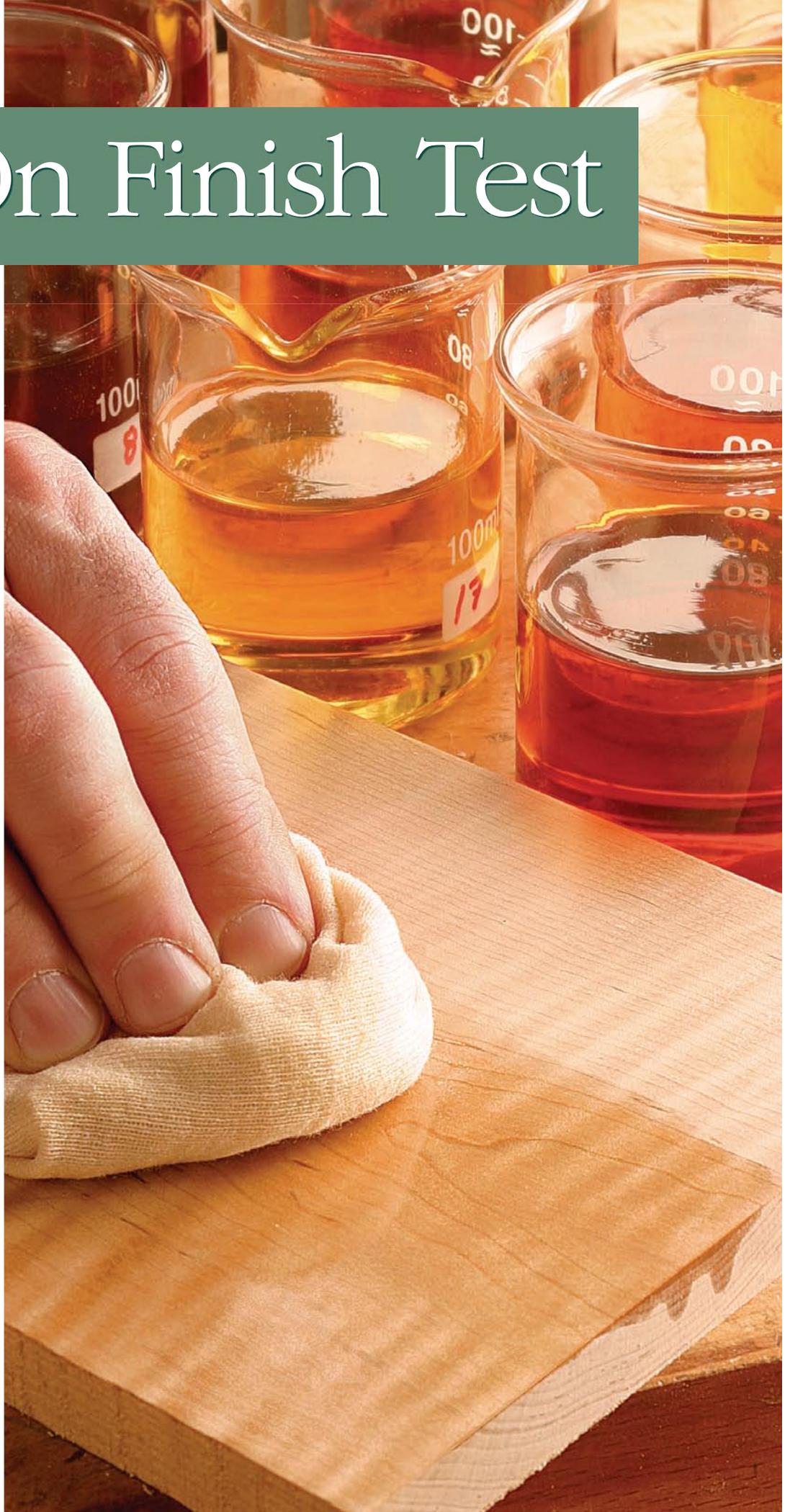
BY CHRIS A. MINICK

Like many amateur woodworkers, I rely on wipe-on finishes to bring out the best in my projects. These varnish/oil blends, known collectively as Danish oils, are a mixture of varnish resins, solvents, chemical driers, and linseed or tung oils. They give woodworkers the best of all worlds: easy application, quick drying time, and good protection.

However, while doing research for a recent article on oil finishes (see *FWW* #177, pp. 22-26), I became intrigued by the differences between pure-oil finishes and oil/varnish mixtures. The scientist in me took over, and I ended up doing a full-blown study of 17 wipe-on finishes. A few were outstanding and have found a permanent place in my finishing arsenal. Others will never see the inside of my shop again.

Selecting products, preparing samples

There are dozens of wipe-on finishes and I couldn't test them all, so I tried to get a representative sample. I included a water-based finish and both tung-oil and linseed-oil-based finishes in a price range of less than \$6 a quart to more than \$40 a quart. Wipe-on finishes typically fall somewhere between pure-oil finishes and brushed-on finishes in terms of build and protection. To represent these boundaries, I included Minwax Fast-Drying Polyurethane,



a widely available brushing varnish, and pure boiled linseed oil.

All the finishes were tested on 12-in. by 16-in. pieces of red-oak plywood cut from the same sheet. Each piece was sanded using a quarter-sheet pad sander equipped with P120-grit paper followed by hand-sanding with P180-grit paper. The sanding dust was vacuumed off, and three coats of each finish were applied to separate panels. I applied the first coat with a lint-free cloth, adding more finish as dry spots appeared. After 15 minutes, I wiped off the excess and allowed the panel to dry for 24 hours.

To see how each additional coat built the finish, I taped off a quarter of the panel and applied the second coat in the same way as the first, except this time it was wet-sanded with a gray Scotch-Brite pad that equates to about P220-grit sandpaper. Coat three was applied to half the panel and sanded in with a gold Scotch-Brite pad similar to P1000-grit sandpaper. I let the panels dry for two weeks before beginning the tests because by that time most oil-based finishes are 95% cured.

The first tests are ease of use and drying time

I wanted the tests to be as objective as possible. For ease of application, I tested the viscosity and the drying time of each finish. To determine beauty, I ranked the finishes by color from lightest to darkest, measured their sheen, and tested their ability to penetrate the wood. Finally, I tested each finish for solids content and the ability to protect the wood from water damage.

Most of the finishes were ideal for wiping. Exceptions included Sam Maloof's Poly/Oil Finish and Tried & True Varnish Oil, which were difficult to wipe on and off. I really had to work at it to apply an even coat of either. The water-based Hydrocote Danish Oil Finish applied easily enough, although I did feel a little weird smearing this white stuff over a nice piece of wood. However, wiping off the excess finish after a 15-minute soak was a real chore. It was downright glue-like. In fact, small pieces of my wiping cloth stuck to the finish and had to be removed with tweezers.

I was surprised by the drying speed of these finishes: Most dried in less than eight hours, meaning that a couple of coats could be applied in a day. Three others needed a full 24 hours to dry,

Is it easy to apply?

The viscosity, or thickness, of each finish was tested by measuring how fast it flowed out the hole in the bottom of a drip cup. A lower viscosity rating indicates the finish is easier to wipe on and off.



How fast will it dry?

Minick coated small glass plates with wet finish, then tested the samples every hour for 12 hours to measure the drying time. Short dry times are better. After that, the plates were checked every four hours. The finish was wet if it felt tacky or a finger dragged across the glass left a visible smudge.

Will it color the wood?

Color is a consideration when selecting a wipe-on finish. Medium or dark woods, like cherry or walnut, are very forgiving because the base color of the wood dominates. Not so for pale woods like maple, which takes on a pronounced amber tone when finished with one of the darker finishes.



Hydrocote Danish Oil has a milky appearance when liquid, but dries clear.

Hydrocote Danish Oil Finish



Watco Wipe-On Poly Finish



Minwax Fast-Drying Polyurethane Varnish



Minwax Wipe-On Poly



Watco Natural Danish Oil



Sam Maloof's Poly/Oil Finish



Sutherland Welles Tung Oil High Luster



Boiled Linseed Oil



Minwax Antique Oil Finish



Sutherland Welles Wiping Varnish High Luster



Tried & True Varnish Oil



J.E. Moser's Natural Danish Oil



Woodcraft Clear Urethane Oil Finish



General Finishes Seal-A-Cell/Arm-R-Seal



Waterlox Original High Gloss Finish



Waterlox Original Sealer/Finish



J.E. Moser's Polymerized Tung Oil

while even after 30 days. the Tried & True Varnish Oil was still wet.

Measuring color, gloss, and penetration

Because color is either a good or a bad thing depending on your point of view, I simply poured each finish into a glass jar and lined them up from lightest to darkest.

I measured the gloss of each finish in five different places on the panels, averaged the results, and recorded the gloss number. Then I used the standard industry table to convert that number to a sheen description. The results varied, from a dead-flat 3 for Hydrocote Danish Oil Finish to a semigloss 40 for Waterlox Original High Gloss Finish. For comparison purposes, the number for an unfinished red-oak panel was 3.

Directly measuring wood-penetration depth requires a laboratory full of sophisticated equipment, but a reasonable estimate can be made with a simple glass capillary tube. The higher a finish rises in the tube, the deeper it will penetrate wood, and the more it will highlight the grain.

Waterlox Original High Gloss Finish (0.745 in.) is a better choice than Sam Maloof's Poly/Oil Finish (0.430 in.) for popping subtle figure from a piece of wood. Conversely, J.E. Moser's Polymerized Tung Oil Varnish (0.439 in.) is a better choice than Minwax Antique Oil Finish (0.746 in.) for finishing blotch-prone woods like cherry (less penetration means less blotching).

More solids, fewer coats

In the finishing world, solids content refers to the amount of dry resin left on the wood after the solvent has evaporated. To measure the solids in each finish, a small amount was weighed, then dried in a laboratory convection oven. The weight of the dried sample was compared to the weight before drying and converted to a percentage.

With higher solids, you need fewer coats to get the desired look. But more is not always better. High solids often means higher viscosity (more difficult to apply) and lower penetration (less protection), so the solids content should be the deciding factor only when all other parameters are equal. I would select Watco Wipe-On Poly Finish at 29% solids over Sam Maloof's Poly/Oil Finish at 85% solids for a tabletop, because the Watco product penetrates more deeply and dries flat in four hours. In this case, while it will take more coats to get the desired sheen, the greater protection

Does it look good?

Appearance is a function of both sheen and penetration. A gloss meter was used to check the sheen produced by three coats of finish (right). The meter shines a light at a 60° angle to the surface and converts the volume of reflected light to a number. Next, a capillary tube was held in the finish for 15 seconds, and the distance the finish was drawn up the tube was measured with dial calipers (lower right). This is an indicator of how well the finish will penetrate wood.



Will it protect the wood?

To see how well each finish protected the wood, water was sprayed on each panel, and a steel bolt with its face freshly sanded was placed on the board. After drying overnight, the board was examined to see whether the wet steel had reacted with the tannic acid in the oak to form a blue-black stain.





Which wipe-on finish is the best?

All but two of these finishes fared well, yet the performance of Minwax's Wipe-On Poly was particularly impressive. The adage "You get what you pay for" doesn't apply here: At \$5.95 a quart, the best-overall choice is also the least expensive finish tested, which makes it the best value as well. The Waterlox Original High Gloss Finish was a close second. Two popular products, pure boiled linseed oil and Minwax Fast-Drying Polyurethane, a brushing finish, were included for comparison.

and a fast dry time are more important. To evaluate each finish's water resistance, I sprayed each finished piece with water and placed a large steel bolt on the wet panel. In the presence of water, iron reacts with the tannic acid in oak to form a blue/black stain. The next day, I removed the bolt and inspected the panels. Panels with no visible staining received an excellent rating; those with a slight mark were rated good; panels with a light blue discoloration rated fair, while those with a deep blue/black stain rated poor.

Finishes with a high oil content like Watco Natural Danish Oil or Tried & True Varnish Oil fared badly in this test, while finishes rich in resin, Minwax Wipe-On Poly or Waterlox Original High Gloss Finish, performed well.

The good, the bad, and the ugly

It was difficult to select a single winner from this field. All but two performed well,

Product	Contact
BOILED LINSEED OIL	Widely available
MINWAX FAST-DRYING POLYURETHANE VARNISH	Widely available
GENERAL FINISHES SEAL-A-CELL/ARM-R-SEAL*	www.woodcraft.com
HYDROCOTE DANISH OIL FINISH	www.highlandhardware.com
J.E. MOSER'S NATURAL DANISH OIL	www.woodworker.com
J.E. MOSER'S POLYMERIZED TUNG OIL VARNISH	www.woodworker.com
MINWAX ANTIQUE OIL FINISH	Widely available
BEST OVERALL CHOICE BEST VALUE CHOICE MINWAX WIPE-ON POLY	Widely available
SAM MALOOF'S POLY/OIL FINISH	www.rockler.com
SUTHERLAND WELLES TUNG OIL HIGH LUSTER	www.garrettwade.com
SUTHERLAND WELLES WIPING VARNISH HIGH LUSTER	www.garrettwade.com
TRIED & TRUE VARNISH OIL	www.woodcraft.com
WATCO NATURAL DANISH OIL	www.woodcraft.com
WATCO WIPE-ON POLY FINISH	www.woodcraft.com
WATERLOX ORIGINAL HIGH GLOSS FINISH	www.woodcraft.com
WATERLOX ORIGINAL SEALER/FINISH	www.woodcraft.com
WOODCRAFT CLEAR URETHANE OIL FINISH	www.woodcraft.com

*Seal-A-Cell used for first coat, Arm-R-Seal for second and third coats according to manufacturer's instructions.

but I was particularly impressed with the performance of Minwax Wipe-On Poly. After the test, I used it to finish a walnut and figured maple dining-room set I had just completed. Apparently the adage "You get what you pay for" doesn't apply to wipe-on finishes: At \$41.95 a quart, Sutherland Welles Wiping Varnish is seven times more expensive than the \$5.95 Minwax Wipe-On Poly, but the Minwax product performs better.

Choosing the worst performer was much easier: Tried & True Varnish Oil is hard

to apply, hardly penetrates the wood, has no sheen, is expensive, and—worst of all—doesn't dry.

Hydrocote Danish Oil walks away with the ugly award. The oak panel finished with this product had a bleached-out appearance. In fact, the unfinished oak panels that I used for the tests looked better than the ones finished with Hydrocote Danish Oil. □

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Viscosity (seconds)	Dry time (hours)	Color (1 = lightest)	Sheen	Penetration (capillary tube)	Measured solids	Water resistance	Cost per quart
30	24	8	Flat	0.695 in.	100%	Poor	\$7.95
35	2	3	Semigloss	0.734 in.	39%	Excellent	\$10.99
20	2	14	Low-gloss	0.624 in.	39%	Fair	\$15.50
40	24	1	Flat	0.509 in.	66%	Poor	\$12.99
18	9	12	Satin	0.583 in.	56%	Excellent	\$11.49
87	3	17	Low-gloss	0.439 in.	42%	Fair	\$14.99
18	5	9	Low-gloss	0.746 in.	37%	Poor	\$10.99
18	3	4	Satin	0.632 in.	32%	Excellent	\$10.99
45	24	6	Flat	0.430 in.	85%	Good	\$15.99
22	3	7	Low-gloss	0.759 in.	51%	Good	\$41.20
28	3	10	Satin	0.592 in.	52%	Good	\$41.95
264	> 30 days	11	Flat	0.348 in.	100%	Poor	\$24.99
16	12	5	Flat	0.548 in.	42%	Poor	\$12.50
17	4	2	Satin	0.663 in.	29%	Good	\$13.99
21	3	15	Semigloss	0.745 in.	43%	Excellent	\$22.99
18	3	16	Low-gloss	0.684 in.	29%	Good	\$17.99
18	4	13	Satin	0.678 in.	38%	Good	\$15.99

