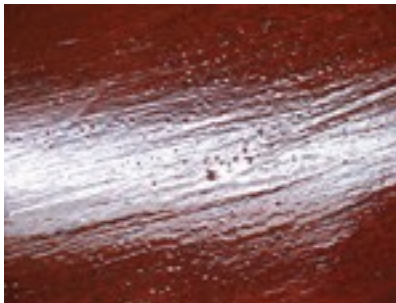


The Basics of Wiping Varnish





All of these finishes are wiping varnish. If you shop at a home center or paint store, you will find the brands above. If you shop at a woodworking store or from a woodworking catalog, you will find the brands on the right. All of these finishes are essentially the same. They are varnish thinned enough with mineral spirits so they are easy to wipe on the wood.



Varnish is a difficult finish to apply with near-perfect results because it cures slowly and is relatively viscous. The slow curing creates time for dust to settle and become embedded, and for runs to develop. The thickness makes brush marks likely and increases the possibility of bubbles curing in the finish.



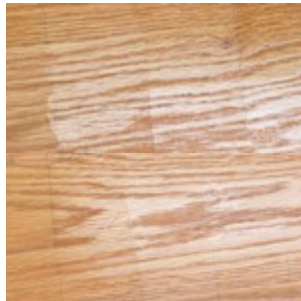
To tell if a finish that thins with mineral spirits and is sold as oil or labeled with some uninformative name is wiping varnish, put a puddle on top of the

can and let it cure. If it cures hard and smooth within a day or two, it is wiping varnish. If it takes a lot longer and finally cures soft and wrinkled, it is oil or a mixture of oil and varnish.

Each of these finishes is a type of varnish. You can thin any one of them with mineral spirits to make a wiping varnish. The wiping varnish will have the characteristics of the varnish you use.



To make your own wiping varnish, add mineral spirits to any varnish. The more thinner you add, the better the finish will level and the less dust it will collect. But the thickness of each coat will be less. Begin by thinning with one part mineral spirits to two or three parts varnish, and adjust from there to your satisfaction.



You can see the differences in the build of four coats of varnish thinned with 25 percent mineral spirits (top) and 75 percent mineral spirits (bottom). From left to right the first section has one coat, the second section has two coats, the third section has three coats, and the last section has four coats. Each coat was brushed on and not wiped off. The lower the percentage of mineral spirits the greater the build of each coat, but the more likely you are to get brush marks and dust nibs.



After sanding the wood to remove machine marks and other flaws, use a cloth to wipe on a wet coat of wiping varnish. You can control the wetness of the cloth to apply an evenly wet coat of finish everywhere. Otherwise, come back over with a drier cloth and even out the thickness or totally remove the excess. You can also use a brush for application, of course, but I find that using a cloth is much faster unless you intend to leave all the excess.



After each coat has cured hard enough so it powders when sanded (four hours to overnight, with the time being longer the thicker the finish and the lower the room temperature), hand sand the finish smooth. Remove the raised grain after the first coat, and dust nibs after all coats. Use the finest grit that will remove the roughness efficiently – usually #280 to #400 grit. Don't sand more than necessary to make the surface feel smooth or you might sand through.



After removing the sanding dust using a "tack cloth" or vacuum (so as not to stir up dust in the air), brush or wipe on another coat of wiping varnish. Brush and leave the excess if you want to build the thickness with fewer coats. Wipe and remove part or all of the excess if you are trying to keep the finish build thin, or if you are having problems with brush marks, bubbles or too much dust sticking to the wet finish.



If dust nibs remain in the finish after the final coat, rub the surface lightly with a brown paper bag. The paper is abrasive enough to smooth over the nibs, but not so abrasive that it leaves scratches in the finish. Be sure the finish has thoroughly hardened before doing this.

by Bob Flexner

Of all finishes available, none offers as much protection and durability with as little difficulty in application as wiping varnish.

With wiping varnish you can achieve a run-free, brush-mark-free, air-bubble-free and almost dust-free finish, which after several coats is very protective against moisture penetration, and resistant to scratches, heat and solvents. And you can do this with no more effort than wiping or brushing on the finish, and either leaving it, or wiping off some or all of the excess.

No other finish offers all of these great qualities. The only finish that competes is gel varnish, but it's messy to apply, and it can't be built up as fast on the wood without leaving brush marks. Wiping varnish is arguably the single best finish for most amateur woodworking projects.

What is Wiping Varnish?

Wiping varnish is simply common oil-based varnish (any type, including alkyd varnish, polyurethane varnish or spar varnish) that is thinned enough with mineral spirits (paint thinner) so it is easy to wipe on wood. You can easily make your own.

The name, which I created in 1990, and which has been adopted by most writers and teachers of wood finishing, makes sense because the purpose of thinning is to make the varnish easy to wipe.

You may already be using wiping varnish and not realize it because it isn't sold under that name (maybe because that would give away the simplicity of the finish). It's sold under many different brand names, and few indicate what the finish really is.

This is the problem with wiping varnish and the reason it isn't widely recognized as one of the best finishes for anyone not using a spray gun. Manufacturers obscure the true nature of the finish by their misleading, and sometimes outright deceptive, product labeling. They want you to think they are selling you something different and special.

In this article I will tell you about varnish, how wiping varnish came to be, how to make and identify wiping varnish and how to apply wiping varnish. I will also explain how wiping varnish differs from oil, and mixtures of oil and varnish. (See "Testing for Oil: Does It Get Hard?" on page 74.)

What is Varnish?

Varnish is a very common finish that is appreciated for its terrific moisture, scratch, heat and solvent resistance. No matter how new you are to woodworking, you have probably used some type of varnish or oil-based paint, which is varnish with pigment added.

One way to identify varnish is by the thinner and clean-up solvent listed on the container. This is mineral spirits, which is usually identified by its more all-inclusive name, "petroleum distillate." The only other finishes that thin and clean up with mineral spirits are oil, blends of oil and varnish, and wax. None of these finishes cure hard, so they can't be built-up thick on the wood like varnish can.

All types of varnish are made by cooking an oil with a resin. (This is done in controlled conditions; you shouldn't try it yourself because of the fire hazard.) The oil, which is usually linseed oil, tung oil or modified soybean (soya) oil, makes it possible for the finish to cure in contact with the oxygen in air. The resin, which is usually alkyd or polyurethane, provides the hardness in the finish.

The most popular type of clear varnish is polyurethane varnish. It is the most protective and durable of the varnishes. That is, it is the most resistant to moisture penetration, and it is the most resistant to being damaged itself by coarse objects, heat or solvents.

Spar or "marine" varnish is also widely available. Its unique quality is increased flexibility created in the manufacturing process by including a higher ratio of oil to resin. Spar varnishes are meant to withstand the greater shrinking and swelling of wood placed outdoors. Sometimes this varnish contains UV absorbers to resist damage from sunlight.

If the varnish is not labeled "polyurethane" or "spar," it is probably alkyd varnish. Alkyd is the workhorse of the varnish resins. Almost all varnishes

contain some alkyd, including polyurethane varnish. Oil paints are almost always made with alkyd resin and are often simply called "alkyd paint."

These are the common types of varnish on the market. You can thin any of them with as much mineral spirits as you want. The more mineral spirits you add, the less "solids" the varnish contains and the thinner each layer of finish will be on the wood. (In some parts of the country it is illegal to thin varnish because of VOC laws, and some brands of varnish reflect this by telling you not to thin their varnish; but you can't harm any varnish by thinning it.)

No finish is perfect in every way, and varnish is no exception. Varnish has two critical flaws: It cures slowly, and it has a fairly thick or viscous consistency.

The slow curing gives dust a lot of time to settle and become stuck, and runs and sags have a lot of time to develop on vertical surfaces.

The thickness is responsible for brush marks and bubbles curing in the finish because it doesn't flatten out well and bubbles don't pop out easily.

As a result, varnish is actually the most difficult of all finishes to apply with near-perfect results. But there is a way around the problem: Thin the varnish so it cures faster (the thinner film combines faster with oxygen in the air), levels better and releases bubbles easier.

The product made by thinning varnish is "wiping varnish."

History of Wiping Varnish

Wiping varnish has been very popular with amateur woodworkers and refinishers for at least 35 years, but few have actually known that it was wiping varnish they were using. The finish was made popular in the late 1960s and early 1970s by Homer Formby. He traveled the country doing demonstrations of his new miracle finish, "Tung Oil," at shopping malls and antique clubs, and he made a number of infomercials that were broadcast on TV.

Few people were familiar with tung oil, which has its origins in China, so the exoticness of the name and source made the finish seem special. Formby was a master salesman.

But he wasn't selling tung oil. He was selling thinned varnish that he labeled "Tung Oil Finish." This finish is still available and the oil used to make the varnish isn't even tung oil. It's modified soybean oil.

It's important to note that even if this finish were made with tung oil – that is, tung oil cooked with a resin to make varnish – it still wouldn't be "tung oil." It would simply be varnish made with tung oil instead of some other oil.

Formby made contact with a very large number of people, however, and his mislabeled wiping varnish was a very good finish. So he won a big following and created a market for finishes labeled "tung oil." Soon other manufacturers joined in with their own "tung oils." Some made their varnish like Formby did – by cooking alkyd resin with modified soybean oil. Others cooked real tung oil with one of the resins.

Some misunderstood what was happening and actually sold real tung oil in its raw state and this really created problems. Incorrectly labeled or not, thinned varnish is an excellent finish because it cures hard. Tung oil doesn't cure hard, so it can't be built up on the wood without being sticky and gummy.

Moreover, unlike boiled linseed oil, which will produce an evenly attractive satin sheen after just two or three coats, tung oil requires five or more coats to produce an equivalent satin sheen. And each coat requires several days to cure and then has to be sanded smooth before the next is applied. Tung oil is a difficult finish to apply effectively, and many people who have tried it have been very dissatisfied.

Despite the difficulties with real tung oil, the market for a thinned varnish finish had been established. So as time passed, other manufacturers marketed their own versions of wiping varnish. Unfortunately, many of the manufacturers further confused the marketplace by labeling their finishes with non-informative names such as Waterlox, Seal-a-Cell, Salad Bowl Finish, Val-Oil, Profin and more.

The result is that no one using one of these brands now knows what finish they are using if they do no more than read the label. But all of these brands, being wiping varnish, are easy to use, and they produce excellent results.

Make Your Own

You don't, of course, have to buy pre-packaged wiping varnish. You can easily make your own. If you do, you can choose which type of varnish to use, polyurethane, spar or alkyd, and you can also choose between gloss and satin.

After choosing a varnish, turn it into a wiping varnish by thinning it with

mineral spirits. (You can also use turpentine, but there is no advantage, and turpentine is more expensive and has a more pungent odor.)

To recreate a commercial wiping varnish, thin the varnish 50/50 with mineral spirits. To get a faster build, thin the varnish less. The less you thin the varnish, the more you increase the possibility of brush marks and bubbles curing in the finish. You also increase the amount of dust that can stick to the finish because a thicker film (after the thinner evaporates) takes longer to cure.

I suggest you begin with one part thinner to two or three parts varnish, and see how it feels to you. You can always adjust the ratio as you are applying the finish.

Applying Wiping Varnish

There are three good methods of applying wiping varnish: wipe off all the excess; wipe off most of the excess; leave the excess.

No matter which method you use, you need to prepare the wood first by sanding out all the machine marks and other flaws. The finish won't disguise them; it may highlight them.

In most cases begin sanding by hand or with a power sander using #100- or #120-grit sandpaper. Sand through all the "washboarding" left by jointers, planers, routers and shapers, and sand out any other problems.

Then sand with #150- or #180-grit sandpaper. If you use a power sander – for example, a random-orbit sander – it's a good idea to finish off by hand-sanding in the direction of the wood grain using the same grit or one numbered grit finer to remove "squiggles."

Of the three application methods the most foolproof is to apply the finish just like you do an oil finish. Wipe or brush the finish onto the wood, keep it wet for a few minutes until no more dry spots develop, then wipe off the excess with a cloth, leaving the surface just barely damp.

Let the finish cure for four hours to overnight depending on how warm your shop is, then sand the finish smooth using #280 or finer grit sandpaper. I usually use #320 or #400 stearated (gray) sandpaper, which includes a soap-type lubricant to resist clogging. Sand just enough so the surface feels smooth. Don't sand through to the wood.

Dust the surface using a vacuum or a tack (sticky-varnish) cloth you can buy at paint stores, and apply another coat in the same manner as the first.

Continuing with the same steps, apply as many coats as you need to achieve the look you want.

Don't sand the last coat. Instead, if there are some dust nibs that you can feel, simply rub the surface lightly with a brown paper bag. This will smooth over the dust nibs so that you don't feel them anymore (though you may still be able to see the flaws in a reflected light).

Because you are wiping off the excess, you may need to apply five or more coats to get enough build for a nice-looking finish. To reduce the number of coats, simply leave more of the wiping varnish on the surface. In other words, don't wipe off as much of the excess.

To get an even faster build, brush the wiping varnish and leave it just as you would full-strength varnish. The finish will collect more dust nibs this way because it will take longer to dry. But it will level well (as long as it has been thinned enough), and you can always sand out the dust nibs and apply a thinner final coat to achieve near perfection.

You can get an even faster build by brushing several coats of full-strength varnish, and then sand the surface level to remove brush marks and dust nibs. Finally, apply a final coat or two of wiping varnish, which you mostly wipe off.

If you apply a coat of wiping varnish, or full-strength varnish for that matter, and the varnish doesn't level well, bubbles don't pop out, or excessive dust collects on the surface, you can remove the still uncured finish for up to an hour or so by wiping with a rag soaked with mineral spirits or naphtha. You won't damage the cured finish underneath.

At any time in the life of the finish, you can recoat with more wiping varnish to "renew" the surface. Just be sure that the surface is clean and dull – clean of grease and other foreign material and not glossy. One method of achieving this is to wash the surface with detergent, and then lightly sand or use steel wool. **PW**

TESTING FOR OIL: DOES IT GET HARD?

With all of the confused labeling from manufacturers, how can you tell if a finish is wiping varnish? It's simple. If the finish meets these three criteria, it's wiping varnish:

- It thins and cleans up with paint thinner. ("Mineral spirits," "petroleum distillate" or "aromatic hydrocarbon" will be listed on the container.)

- A puddle on top of the can, or on any non-porous surface such as glass, gets hard within a day or two.
- It is watery thin. (Full-strength varnish and polyurethane meet the first two criteria, but they are relatively thick, like syrup. They are also labeled "varnish" or "polyurethane," and wiping varnish is not.)

Curing hard is the critical characteristic because it makes it possible to leave each coat of wiping varnish wet on the surface – as wet and thick as you want as long as the finish doesn't puddle or run. You can build coats one on top of another to achieve a thicker coating for better protection of the wood against moisture.

Confusion is caused because wiping varnish is often sold or marketed as "oil," and it is sometimes included in the same category as oil in books and magazine articles. But oil doesn't cure hard unless you leave it for many months or years, and then only if it is applied very thin. So all the excess oil has to be wiped off after each application or you will end up with a sticky, gummy mess. Oil is about as different from wiping varnish as any finish can be.

It's true that oil is used as an ingredient in the making of varnish, but remember that once the oil and resin have been cooked, they are no longer oil or resin. (See page 72.) I like to compare what happens in varnish to bread. Once you add water to flour and yeast to make bread, you can't go back to flour or yeast, and it would be foolish to call the bread "flour" or "yeast." Likewise, it is totally inaccurate to call thinned varnish "oil" or "resin."

There are two categories of oil: natural oil, and mixtures of oil and varnish. The two common natural oils that can be used successfully as wood finishes are linseed oil and tung oil. Linseed oil is pressed from the seeds of the flax plant. Tung oil is pressed from the nuts of the tung tree. This tree is native to China but is now also grown in Argentina and the U.S. Gulf States.

Linseed oil is sold as "boiled" linseed oil when "driers" are added to cause the oil to cure faster (overnight in a warm room when the excess is wiped off). Without the driers, "raw" linseed oil takes weeks or months to cure, even when all the excess is wiped off. With or without the driers, the oil still cures soft, the same as tung oil.

Both linseed oil and tung oil can be mixed with any type of varnish, and the mixture can be thinned with mineral spirits or turpentine. Many brands of

these mixtures are sold in home centers, paint stores and in woodworking stores and catalogs.

It's important to stress that these are mixtures or blends of oil and varnish. They are different than varnish itself, which is oil and a hard resin that are cooked together.

Because of the oil included in these mixtures, oil/varnish blends don't cure hard. So you have to wipe off all the excess after each application just as you do with linseed oil and tung oil. Otherwise, you will end up with a sticky, gummy surface.

Recently, I saw a woodworking magazine article that compared a large number of "wipe-on" finishes for characteristics such as viscosity, dry time, penetration and solids content (ratio of finish to thinner). Some of the finishes in the comparison were wiping varnishes. Others were oil/varnish blends.

The article was virtually useless as an aid to choosing a finish because the characteristic that matters most, "Does it cure hard?" wasn't included. You will never make sense of "wipe-on" finishes and overcome the confusion caused by misleading labeling until you understand this distinction.

If a finish thins with mineral spirits, cures hard, and is watery thin, it is wiping varnish. If a finish thins with mineral spirits, is in liquid form (it isn't wax), and cures soft, it is oil or a mixture of oil and varnish. There aren't any other possibilities for a finish that thins with mineral spirits. – **BF**



These are examples of oil/varnish blends, simply mixtures of linseed oil or tung oil and varnish, usually thinned with mineral spirits. You can tell that a finish is an oil/varnish blend if it contains mineral spirits and a puddle on top of the can or other non-porous surface takes days or weeks to cure to a very soft and usually wrinkled film.

Bob is author of "[Understanding Wood Finishing](#)," now in its second, fully revised, edition. To purchase, visit amazon.com, your local bookstore or a woodworking supply store.