

By [Bob Flexner](#) Posted [December 19, 2023](#) In [Finishing](#)

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Your decision is simplified by the process of elimination.

At some point as you progress in woodworking, you begin to realize that there are many finishes to choose among; you probably ask yourself if you are using the best finish for your project.

Choosing is not as hard as it seems because there are only seven basic types of finish used by woodworkers: wax, oil, varnish (including polyurethane varnish), shellac, lacquer, water-based finish and catalyzed or two-part finish.



Application method narrows choices. Though there are seven categories of wood finish, you will most likely choose from just four, depending on your application method. If you're using a spray gun, choose among shellac, lacquer, water-based finish and catalyzed finish (left). If you're using a rag or brush, choose among oil, varnish, shellac and water-based finish (right).

It gets easier. You can eliminate wax for almost all projects except small decorative objects such as turnings and carvings that aren't handled much. Wax doesn't work well as the sole finish because when buffed out thin, it isn't water-resistant (only water-repellent) and grime gets ground into it when touched repeatedly by hands. (Wax is an excellent polish over another finish, however, because it adds shine and creates a slick surface that resists scratches.)

With wax out of consideration, you can then eliminate two more finishes based on the application tool you use: rag, brush or spray gun.

If you use a spray gun, you wouldn't apply oil or varnish because they are very messy. They dry so slowly that the uncured overspray settles on and sticks to everything it comes in contact with.

Moreover, the appearance and durability of oil and varnish can be easily matched with faster-drying finishes. For example, an oil finish can be

imitated with one or two thinned coats of a satin finish, and the superior durability of polyurethane varnish can be matched with any catalyzed finish.

If you use a rag or brush, you wouldn't apply a catalyzed finish and you would rarely apply lacquer because of the fast drying and the strong odor of both. (Brushing lacquer, which dries more slowly, could be thought of as an exception.)

So if you use a spray gun, the choices are narrowed to four: shellac, lacquer, water-based finish and catalyzed finish. If you use a rag or brush, the choices are also narrowed to four: oil, varnish, shellac and water-based finish. Notice that shellac and water-based finish are the only ones applied both ways.

Choosing within each group of four then comes down primarily to choosing for protection and durability, application ease and color – usually in that order of importance.

Protection & Durability

Protection means resistance to liquid penetration, keeping in mind that thicker films are always more resistant no matter what type of finish is used. Durability means resistance of the finish film itself to damage from scratches, heat, solvents, acids (for example, body oils and sweat) and alkalis (for example, cleaning products). For the most part, finishes that are rated high in protection are also high in durability, so we can consider the two together.



Poor durability. Finishes such as shellac, lacquer and water-based finish break down from repeated contact with the acids in body oils and sweat, as shown in this close-up of a lacquered crest rail from a chair.

Table #1 compares the protection and durability characteristics of wiped and brushed finishes, from best to worst. Table #2 compares sprayed finishes.

Table #1: Protection & Durability, Wiped or Brushed Finishes

FINISH	PROTECTION & DURABILITY
Oil-based varnish & polyurethane	Both offer exceptional protection and durability; polyurethane is more durable than common alkyd varnish.
Water-based finish	Good protection and very scratch-resistant, but not as heat-, solvent-, acid- and alkali-resistant as varnish or polyurethane.
Shellac	Good protection, with dewaxed shellac more protective than shellac with wax included. Durability is weak compared to other film-building finishes but much better than oil.
Linseed oil, tung oil & oil/varnish blend	These cure too soft to be scratch-resistant, or to be built up to provide good water resistance.

Table #2: Protection & Durability, Sprayed Finishes

FINISH	PROTECTION & DURABILITY
Catalyzed finish	All catalyzed finishes are exceptionally protective and durable, with conversion varnish the most so. All are equivalent to, or better than, oil-based polyurethane.
Water-based finish	Good protection and very scratch-resistant. But heat-, solvent-, acid- and alkali-resistance are more like lacquer.
Lacquer	Good protection, but scratch-, heat-, solvent-, acid- and alkali-resistance are only a little better than shellac.
Shellac	Good protection; dewaxed shellac is better than shellac with wax included. Durability is slightly less than lacquer because of the greater vulnerability to alcohol.

Ease of Application

Ease of application is an important consideration, especially for beginners. For example, the popularity of oil and oil/varnish blend finishes, which offer very poor protection and durability, is due primarily to their ease of use.



Oil finishes. Oil and oil/varnish-blend finishes are popular because they are so easy to apply. Simply wipe them on and wipe off the excess.

Table #3 compares the relative ease of application of wiped and brushed finishes, from easiest to hardest. Table #4 compares sprayed finishes.

Table #3: Ease of Application, Wiped & Brushed Finishes

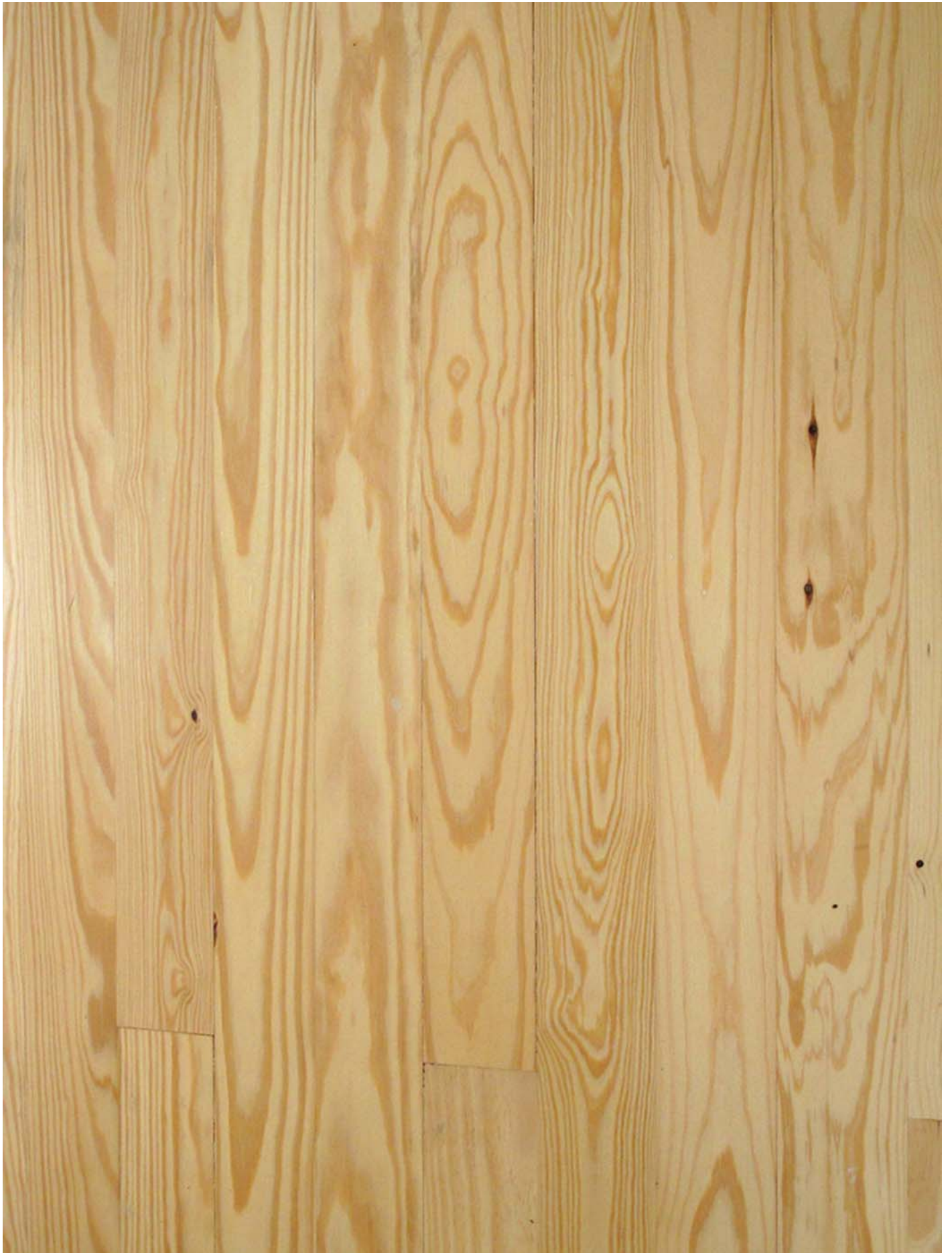
FINISH	EASE OF APPLICATION
Linseed oil, tung oil & oil/varnish blend	The easiest of all finishes to apply; simply wipe on and wipe off the excess after each application.
Oil-based varnish & polyurethane	The easiest finishes to brush because of the long drying time, but vulnerable to dust nibs; and a strong, lingering odor.
Water-based finish	Easy to brush, but you have to work fast because the finish dries quickly. Also, you have to deal with severe raised grain.
Shellac	Brushing is more difficult than with water-based finish because of fast drying and ridging. Wiping (French polishing) is a difficult skill to master.

Table #4: Ease of Application For Sprayed Finishes

FINISH	EASE OF APPLICATION
Lacquer	Very easy to spray, especially because of the variety of solvents available, which can be added to control drying time. A strong and lingering odor.
Shellac	Easy to spray, but no blush-eliminating solvents are commonly available.
Water-based finish	Less easy to spray successfully than lacquer or shellac, but no lingering odor.
Catalyzed finish	Pre-catalyzed lacquer is similar to lacquer. Post-catalyzed lacquer and conversion varnish are easy to spray but require accurate mixing of the two parts. A strong and lingering odor.

Finish Color

The color a finish adds to wood can be very important, especially if you don't stain the wood. Because most finishes add some degree of yellow/orange color to the wood, choosing for color hasn't always been a big consideration. But with the introduction of water-based finishes, which don't add any color, this consideration has risen in importance, even becoming the most important in some instances.



Water-based finish for color. Water-based finishes provide a unique and attractive look on white woods such as this pine floor because these finishes don't add any yellow/orange coloring.

Table #5 compares the relative amount of yellow/orange coloring all six finishes add to wood, from least to most.

Table #5: Choose a Finish For Color

FINISH	COLOR
Water-based finish	Adds no coloring to wood but does darken it a little. The lack of added color can be desirable on white woods, but causes darker woods to look "washed out" unless a stain is applied.
Catalyzed finishes	Catalyzed lacquer adds a light yellow tint because of the included nitrocellulose. Conversion varnish adds almost no yellowing but does darken the wood a little.
Lacquer	CAB-acrylic adds almost no yellowing to wood but does darken it. Nitrocellulose adds a light yellow tint to wood, similar to that of clear and blonde shellac but less than oil-based polyurethane.
Shellac	Clear and blonde shellac add a light yellow coloring to wood. Amber and orange shellac add a distinct orange coloring to wood, more than that of linseed oil and tung oil. Other shellacs are in between or even darker.
Oil-based varnish & polyurethane	These add more orange coloring than lacquer or clear/blonde shellac but less than linseed oil and tung oil.
Linseed oil, tung oil & oil/varnish blend	Except for amber/orange shellac, these finishes add the most orange coloring to wood, with oil/varnish blends adding slightly less than the pure oils. Moreover, they all darken noticeably as they age.

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