

# Demystifying Wax

## *Clearing up some cloudy questions about an ancient finish*

by Bob Flexner

I've used wax for years to restore the luster of the finish on the furniture I repair. But it wasn't until I started testing some of the popular brands that I realized what a thoroughly misunderstood material wax is. Consider, for example, the following statements made by well-known polish manufacturers and authors of books on finishing: "A finish must breathe, and wax prevents this." "You should remove wax twice a year because it builds up and softens the film with age." "This traditional polishing wax ...feeds the wood." "Wax tends to get gradually darker over the years." Despite the authority of the sources, I've found all these claims to be utter nonsense.

The ad hype concerning wax products is so prevalent that I think many people are confused about using wax to polish, protect and care for wooden furnishings. In my quest to clear up confusion about waxes, I interviewed a dozen finish chemists and professional wood finishers. I hope the following explanations will clear the air about what wax does (or does not do), how it works and how to use it.

First, a quick introduction to the waxes. Manufacturers today can choose from many natural and synthetic waxes to obtain a good wax product—one that protects well and is easy to apply. Among the most popular waxes: Beeswax is a soft wax secreted by bees for comb building and was historically the primary wax for woodwork; carnauba wax comes from palm leaves and is the hardest of the natural waxes; candelilla, from a desert plant found in northern Mexico and southern Texas, is often used in blends because of its low cost and compatibility in mixing with other waxes; and paraffin refined from petroleum is a very soft wax that's often blended with harder waxes to make them easier to apply.

The key to understanding wax lies in knowing its natural properties: It's a substance that's insoluble in water; a thin film of wax is capable of withstanding wear because it creates a low-friction surface things slide off of; wax bonds with tenacity to almost any solid material, but not to itself; and wax can be easily dissolved in a solvent, such as mineral spirits. The first two characteristics are important for understanding how wax protects, the third and fourth for understanding how to apply and remove it.

**Wax protection**—The primary finish on a piece of furniture, whether it be oil, lacquer or varnish, protects the wood from liquids or abrasion and reduces the exchange of moisture vapor between the wood and the atmosphere. Contrary to the all-too-commonly held belief, wood does not need to breathe, nor does it need to be fed. In fact, ideally, we would want to seal it off entirely from the atmosphere if we could. This moisture exchange, which will occur no matter what type of finish is applied, may cause the wood to warp, veneer to come loose, joints to come apart, and if the moisture is severe enough, wood to rot. Keeping the finish in good shape will postpone these problems, and wax is the best material I know of to accomplish this. It will repel liquids and deflect blows that might otherwise destroy the finish. Most waxes are inexpensive and easy to apply, and a wax finish is simple to keep in good repair. Further, a well-buffed wax coating imparts a soft, pleasing luster to a finish that can accentuate both the wood's color and grain.

Most woodworking finishes bond well to themselves and offer more protection if a thicker layer is built up with several coats. On the other hand, wax used as a polish is a material where less is better. To understand this, take a colored wax crayon and rub it on a piece of glass. If you keep rubbing long enough, all the wax ends up on the glass. But if you try to remove the wax from the glass with a cloth, you'll find that all of it wipes off except for a film so thin you can't see it. No amount of rubbing will remove this. Though wax crayons are softer than most waxes, the analogy still holds. Wax adheres with great strength to almost any solid surface, but it doesn't bond well to itself.

When the excess wax isn't properly buffed off, the effect is somewhat like the crayon on glass. As more coats are added, the wax layer becomes thicker and, like the crayon, will smear and mar easily. Further, this gummy layer collects dust and darkens over the years due to the dirt that becomes embedded in it. This has led many to believe that it's the wax itself that darkens with age. But if only one or two coats of wax are applied and rubbed down to the thinnest possible layer, a water-repellent and mar-resistant surface that will not smear or collect dust is produced. There's no reason to apply more coats of wax, since additional



*Dozens of brands of commercial waxes suitable for applying over furniture finishes are available. Among the most common raw ingredients are the ones shown in the plastic bags at the right. From left to right: beeswax, candelilla and carnauba.*

coats won't necessarily add protection and they will probably rub off when you buff it out. So despite the claims of polish manufacturers, a well-buffed wax finish will never develop wax buildup.

**Applying wax**—You can apply wax with steel wool, a dry or dampened cloth, or with a lump of wax inside a cloth. They all work decently, but there are some distinctions worth noting. Steel wool guarantees a duller sheen when waxing over a glossy finish. It's good if you want to dull a too-shiny surface and apply wax at the same time. But a steel-wool applicator shouldn't be used if you want the final finish to have a maximum gloss. Using a dry cloth works fine, but a dampened cloth makes application smoother. My favorite way of applying wax, however, is to put a chunk of it inside a cotton cloth. I hold it in my hand for a minute or two, warming and kneading the wax so it will spread evenly through the cloth. I can wax a fairly large surface quickly, without having to constantly reach back in the can to pick up more wax.

Obtaining an optimally thin coat of wax on a surface isn't difficult when you understand how solvents are used to make wax work. Solvents such as turpentine, mineral spirits and naphtha are added to wax blends to create workable pastes and liquids. (CAUTION: Because these solvents are flammable, never heat commercial or homemade waxes over an open flame.) After the softened wax is applied and the solvents evaporate, the wax resolidifies. If you allow this thicker-than-desired wax layer to dry completely, it will take a lot of rubbing to get the excess off. If, however, you catch the wax at the point where it's bonded to the surface but the excess is still soft, then it wipes off easily—even if you've applied a very thick coat. You can't predict how long this drying process will take, as instructions on most wax products would lead you to believe. The appropriate moment to buff out the wax occurs relatively soon after application, but varies with the temperature and evaporation rate of the solvents. Visually, you can see it happening when the wax loses its wet shine and hazes over. If you wipe the wax before it dries, you'll remove too much. If you wait too long, you'll get streaks that will be difficult to remove, save with an electric buffer or polisher. You can also remove streaks by applying a new layer of wax to redissolve the hardened one, allowing it to be buffed out evenly. If you can smear the surface with your finger, then you have not removed all the excess wax.

In the same way that fresh wax can redissolve dried wax, the solvents used to make wax can also be used to remove it. A rag moistened with naphtha or mineral spirits will quickly remove all the wax on a surface. Naphtha leaves little residue and evaporates quickly, so it's my favorite solvent. Neither naphtha, mineral spirits or any other commercial wax I know of will damage any primary finish, as long as the finish is more than two or three days old.

Solvents—not waxes—are the main ingredients in most liquid-spray and wipe-on polishes sold in supermarkets and department stores. Therefore, never apply one of these polishes to a waxed surface, because the polish might cause the wax to streak or remove it altogether. Waxed woodwork should be dusted with a dry cloth or feather duster and cleaned, if necessary, with a damp cloth. If a waxed surface becomes dull or marred, try rubbing out the marks and buffing up the luster with a soft cloth. If this fails, try another application of wax. This might be needed once every three months to a year on a tabletop that gets constant use and much less often on surfaces that see less use. If marks don't come out with re-waxing, the damage is likely in the primary finish.

**Reviving a finish**—Wax also can be effective for reviving the appearance of an old, worn finish. You can apply the new wax right over the old, because the solvents will redissolve any remaining old wax. It may be advisable to clean the piece first with mild soap and water to remove any dirt that has accumulated on the surface. It may even be necessary to rub out the piece with steel wool or sand lightly if the primary finish is lightly scratched or crazed. But this should never be done to a very old finish that has historic value. To hide scratches and recolor worn or damaged areas, you can apply pigmented waxes that come in wood tones. Most clear waxes can be colored with regular oil-based pigments. Experiment on a small inconspicuous section of a finished piece to determine the procedure that will get the best results. Remember though, a wax coating is very thin and won't hide imperfections on a badly cracked or worn finish. It should seldom, if ever, be necessary to remove the wax completely from an older piece, and could be ruinous on an antique: It might destroy some of the patina and reduce the value of the piece.

In addition to its use as a polish on an existing finish, wax can be used as a primary finish, as it was in the 16th to 18th centuries. But unfinished woods can absorb a great deal of wax, so it will be necessary to apply many coats. Just as with the wax crayon analogy, wax that builds several layers thick in the wood's pores and crevices does not bond well to itself. But these areas are so small that they have little effect on the overall wax surface. To reduce the number of wax coats needed to finish a piece of woodwork completely, it's best to seal the wood first with a coat of thinned shellac or oil. No more than one coat of wax should ever be needed on a sealed surface, but there are almost always small areas that don't get waxed the first time. A second coat ensures complete coverage and an even luster. □

*Bob Flexner repairs and refinishes furniture in Norman, Okla. His videotape, Repairing Furniture, is available from the Taunton Press, Box 355, Newtown, Conn. 06470.*