

Catalyzed Lacquers

Creating a rich finish that's tough as nails

by David E. Shaw

If you want a clear wood finish that you can tap dance or iron a shirt on, try catalyzed lacquer—it's as tough and strong as baked enamel, more resilient than polyurethane, and doesn't look like plastic. Rather, it has that lovely sheen that only lacquer can produce, and it can be rubbed to a myriad of looks, from a rich gloss, to a mellow satin, or even dead flat.

Catalyzed lacquers also penetrate well and resist everything from intense cold to paint stripper. I prefer them for kitchen and bathroom cabinets, anything for a kid's room, and for tables, floors and other surfaces that are subjected to excessive moisture, temperature variations and plain old physical abuse.

Chemically, catalyzed lacquer is a nitrocellulose base blended with alkyd resins and urea formaldehyde. Hardening is induced by a phosphate ester catalyst, which reacts with the ingredients to form tough, chemical bonds. The amount of catalyst needed is critical and varies from brand to brand, so make sure that you get precise instructions. You should also heed safety warnings—any lacquer will give off fumes, but catalyzed lacquer gives off urea formaldehyde as well. I don't feel this is any more dangerous, but it does smell worse and will quickly give you a headache that can linger for days. If you do not have a good double-cone, organic-vapor respirator and can't provide fans or some other type of forced ventilation, don't use catalyzed lacquers.

There are two distinct types of catalyzed lacquers. The one I prefer produces the toughest finish because the catalyst is added to each coat, from the sealer on. Both Maclac Chemlac (available from distributors of Maclac Lacquer Co., 198 Utah St., San Francisco, Calif. 94103) and Sherwin Williams' Sherwood Super Kemvar HS (Sherwin Williams Co., 101 Prospect Ave., Cleveland, Ohio 44115, and its local distributors) fall into this category. The other lacquer is Synlac, a "bleed through" type, in which only the top coat of lacquer is catalyzed and the catalyst bleeds into the sealer and base coats (available from Industrial Finishing Products, 465 Logan St., Brooklyn, N.Y., 11208). This lacquer goes over Synlac's special barrier-coat sealer, and you can apply it over any finish that the barrier coat will adhere to, which is just about anything. If you want to refinish a lacquered or varnished table without stripping it, for example, you could reseal it with the barrier-coat, then apply bleed-through lacquer.

To use catalyzed lacquers, you must first mix the right amount of catalyst into the lacquer. Since most brands recommend two to four ounces of catalyst to every gallon of lacquer, an ordinary shot glass is an accurate measure for quart-size spray guns. Too much catalyst leaves a greasy finish that may take days to dry and

gives off a disagreeable odor for five or six months. Too little catalyst produces a relatively weak finish.

Once mixed, catalyzed lacquers spray on and dry just like ordinary lacquer, or they can be mixed with thinner and lacquer retarder—an additive which slows drying—and brushed on. Most manufacturers recommend high-grade thinner, which dries slower than inexpensive types, giving the lacquer more time to flow out smoothly and resist the whitish-blue hazing that develops in humid areas. In a pinch, you can hype-up regular thinner by making a mixture of 90% to 95% thinner (by volume) to 5% to 10% retarder. For brushing the lacquer, you can add up to 25% retarder in the thinner mixture, then spread the lacquer with a soft brush, just as you would brush on shellac. Too much retarder gives a greasy finish that can be dried only with a good deal of steel-wool buffering and lots of elbow grease.

Whether you are spraying or brushing, you first must apply at least one coat of a catalyzed sealer, let it dry, then sand lightly with 320-grit wet/dry paper. For open-pore woods, you may have to sand down two or three consecutive coats of sealer until the grain is filled, since catalyzed lacquer cannot be used over wood filler or any oil-based stain. Next apply three or four coats of lacquer, sanding between each coat with 600-grit paper. While manufacturers recommend that you wait four or five hours between coats, I have sprayed three coats in less than three hours.

Once applied, catalyzed lacquer must cure seven to 10 days to develop its full strength. The finish gives off a slight odor as it cures, but if you mixed it right, the odor will go away within a day or so. The disappearance of odor doesn't mean the finish is fully cured. Wait the full 10 days. If you rub out the cured finish with rottenstone, you can create as high a gloss as you'll get with any finish. If you rub with 00 steel wool you can kill the gloss entirely. Use 0000 steel wool for a more satiny effect.

Occasionally, when I'm in the final stages of finishing, I must alter the color of a finish to produce what my customer ordered. You can do this by adding a colored glaze between the lacquer coats or by tinting the lacquer itself. In either case, use oil-based or oil-compatible color (I use so-called Universal colors, either UTC brand, Byzantine brand or Japan colors by Ronan, available by mail order from Industrial Finishing products).

For glazing, I mix color with mineral spirits to form a very thin, weakly-colored stain that I apply with a lint-free rag, wiping with the grain and feathering the glaze at the end of each stroke until I evenly color the entire piece. Let the glaze dry about an hour until it's evenly dull before applying more lacquer. To tint the lacquer itself, add color to thinned lacquer and test until you get the shade you want. There are no tricks here, except your



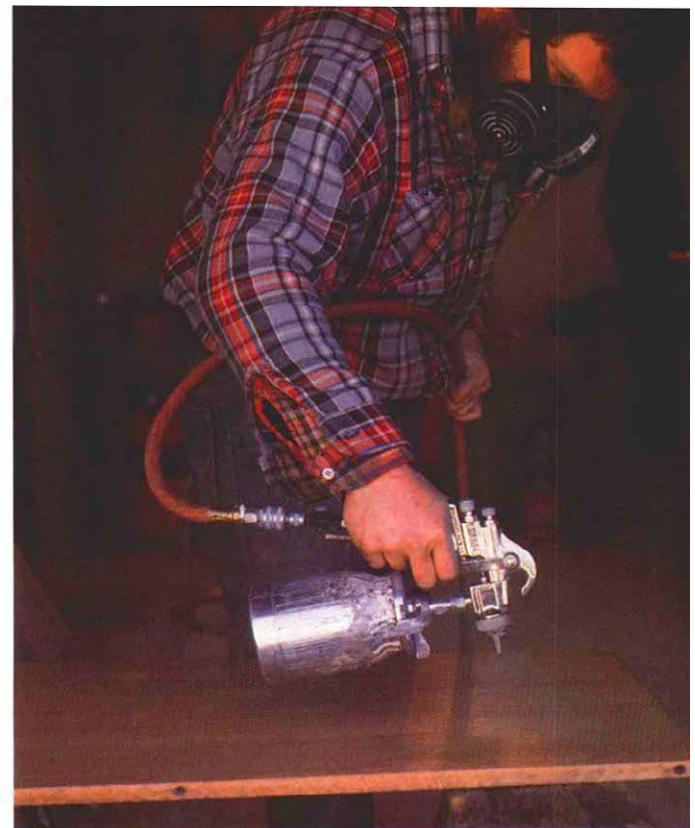
To ensure that the lacquer is free of all dust and impurities, filter each batch through a cone filter as you fill the spray gun cup.

gun control must be perfect—an uneven coat looks horrible.

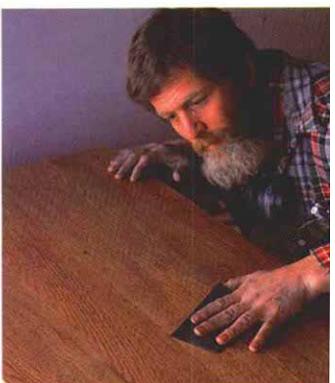
Catalyzed lacquers have many of the same problems as conventional lacquers, and the remedies are often the same. Fish-eye, for example, is caused by contaminants, usually silicon, on the wood. Catalyzed lacquers will fisheye when applied over almost any contaminant, so I always assume that any refinished surface is contaminated and mix a fisheye remover into the lacquer. With new pieces, I test the sealer on some inconspicuous corner. If there is any trace of cratering, I use fisheye remover.

As with conventional lacquer, you can prevent hazing on catalyzed lacquer by adding enough retarder to slow the hardening process, giving the lacquer time to bleed off moisture before drying. The retarder also helps the lacquer flow out smoothly. To minimize air bubbles in the wet film, spray the catalyzed lacquer when the temperature is 75°F to 85°F, a much narrow range than for ordinary lacquer. If you must spray at higher or lower temperatures, add about 5% more retarder.

If something goes wrong, you can remove a catalyzed finish, but do it quickly before the lacquer cures or you're in for one miserable job. Paint stripper will remove partially-cured lacquer, but it takes an awful lot of stripper and even more elbow grease. If the finish has fully cured, straight lye (a can of Draino in a



Shaw sprays catalyzed lacquer just like regular lacquer, with long, even, overlapping strokes, above. A double-cone, organic vapor respirator and fans or other forced ventilation are mandatory. Finishing the finish is the most time-consuming part of the job. To ensure a rich, smooth finish, each coat must be rubbed out with fine wet/dry paper. To check his work, right, Shaw examines the finish closely from a low angle where light reveals any defects.



quart of water) applied over and over works eventually, but it does not do the wood any good. After using the lye, you must rinse the wood with water and vinegar and usually have to bleach it with oxalic acid before refinishing. Make sure you wear your respirator and chemical-resistant gloves, and mix the lye in a plastic bucket—the solution can react with aluminum containers to produce harmful fumes.

Clean your brushes and spray gun immediately with lacquer thinner or acetone, or you will ruin them. Manufacturers claim the lacquer mixture will be usable for about three months, but I've found it must be used within a week if you want the strongest possible coat. Old lacquer won't turn into gelatinous ooze as long as it's kept in a sealed container. You can use it, but don't expect it to be any stronger than regular lacquer. In the last four years I have applied catalyzed lacquer to hundreds of pieces of furniture and numerous kitchen and bathroom cabinets, and have yet to hear a customer complain. So, for a finish that is as tough as nails, lovely to see and simple to apply, catalyzed lacquers are the only way to fly. □

David Shaw is a writer, furniture finisher and restorer in Kelly Corners, N.Y.