# Replacing and Repairing Wood Windows

by Chris Wuerth

In typical "replacement window" jobs, carpenters take out the original windows and replace them (or just the sash) with vinyl, aluminum, or high-end wood windows. But "replacement windows" don't necessarily have the same muntin arrangement, glass area, or molding profiles as the originals. My company, C. Wuerth Restoration Contractor, takes a different approach that conserves as much of the original material as possible. We do this by replacing missing or damaged parts with exact duplicates.

In the final analysis, the cost of repairing two or three badly damaged originals is significantly less than yanking out all the windows and installing new ones. Though our company specializes in buildings from the 1600s to 1800s, the techniques we use to repair windows can be used on any deteriorated wood window — from Victorians to 1920s bungalows. By repairing rotten wood, having new sash made, and tightening up the windows with weatherstripping and interior storms, you can keep the building looking the way it was meant to look.

## Repair Techniques

If the wood muntins are broken or rotten, or if large pieces of stile or rail are in poor condition, you will have to remove the glass and take the windows apart. Then you will use epoxy to repair rotten areas or glue in new pieces of wood.

***Removing glass.*** Be especially patient if you're taking windows apart. Remove glass only where necessary because old glass is only 1/16-inch thick, and it's extremely fragile. Soften glazing putty with solvents before trying to chip it out. Then use a sharp chisel. You can also try a carefully applied flame from a torch. A metal-covered asbestos hot pad will deflect heat from the glass, but any time you heat glass or try to remove putty, you will inevitably break some of the glass. Experiment to see which method of putty removal works best. Be sure to wear a proper respirator if you are burning off lead paint.

***Consolidating and patching.*** Two-part epoxies are great consolidants for soft punky wood. When you use them on window parts, the epoxy consolidant hardens and encapsulates the rotten wood. The consolidated wood then makes a firm base for epoxy filler, which you can use to build the wood back up to its original profile.

**Figure 1.** *Wood dutchmen were used to repair rotten small areas of muntin and the bottom corner of the frame. The new window sill was milled to the same profile as the original because it was too deteriorated to repair.*

Epoxy products, such as consolidants and fillers, are usually available in marine hardware stores. But they can also be ordered by mail. We've had good luck with the *West* system. These folks have a whole line of epoxies, microfibers, microspheres, and microballoons. They also make two hardeners — one slow and one fast. (Gougeon Bros. Inc., P.O. Box 908, Bay City, MI 48707; 517/684-7286). We've also used specialty epoxies from Conservation Services (8 Lakeside Trail, Kinnelon, NJ 07405; 201/838-6412). They have various products that duplicate the strength and flexibility of structural wood, and they make consolidants and flexible putties.

You can also order epoxies by mail from Abatron, Inc. (33 Center Drive, Gilberts, IL 60136; 708/426-2200). If you've never used epoxies, you might want to send for their free video that shows how to mix and patch with epoxy. Another mail-order source is Conservation Materials Ltd. (1165 Marietta Way, Box 2884, Sparks, NV 89431; 702/331-0582).

When working with epoxy, start by drilling 1/16- to 1/8-inch holes in the deteriorated wood, including the window sills and the sash. Space the holes about 1/2 to 1 inch apart. Make sure you drill enough holes to allow the epoxy to spread through the wood fibers and saturate it completely.

Next, mix the epoxy resin with hardener. The hardener sets off a chemical reaction, and the reaction gives off heat. Only mix a small amount at a time — 1 to 2 cups — or you may have too much heat buildup. Also, if you mix too much, the epoxy will harden before you can inject it. Be careful about proportions, and use those recommended by the manufacturer. Then make sure you stir long enough to insure complete mixing. If you're in too much of a hurry, you may have spots that never cure.

Consolidant epoxy is about the same consistency as varnish, and you can brush it on or inject it. We use a plastic mustard or ketchup bottle to squirt the epoxy into the holes. Keep injecting until the wood won't accept any more. Or, if you've taken the window apart, you may want to dip the stile and rail ends in consolidant epoxy. If you use the dip method, be sure to use a slow-acting hardener. (Don't use this method on a hot day, or the epoxy will set up too fast.)

Add a thickener such as colloidal silica or microballoons to the base epoxy to make a strong adhesive. In New England, we can buy microballoons and colloidal silica in the hardware store (Roland T. Warner, Co., New Haven, Conn.). When using it, be sure to wear a dust mask or respirator. These particles are so tiny they can lodge in your lungs.

Where sections of muntin are missing, you can glue in small pieces of pine and shape them later. Use wood dutchmen where large patches are needed (see Figure 1). Glue them in place with epoxy.

Once the patching is done, reassemble the window. We thoroughly soak the sash in a 50/50 mixture of boiled linseed oil and turpentine. Then we prime before glazing with a linseed-oil-based primer.

## Fixing the Frames and Sash

You may have to work on the frames as well when doing restoration, but the same principles we've discussed apply here. Also, make sure that proper metal flashings are installed over window heads, and that clapboard butts are caulked where they meet the frames. We use polyurethane Sikaflex 15-LM caulk (SIKA Chemical Corp., 201 Polito Ave., Lyndhurst, NJ 07071; 800/631-7270). It remains flexible and sticks to almost anything.

If sash is so shot that you cannot repair it with epoxy, be aware that stock windows from a lumber yard will not match historic windows. There will be variations in muntin size and profile, stile and rail dimensions, and frame and sill thicknesses. Buy windows from a sash shop specializing in reproduction work. Bring them a sample of the old window, or, better yet, have the shop come to the site and take their own measurements. They should be able to match the old windows exactly. If you can't find a custom shop in your area, you can order a workbook compiled by the National Park Service. It lists shops that can duplicate any kind of wood historic window. The 368-page workbook also contains information about energy conservation and repair techniques (*The Window Workbook*, Historic Preservation Education Foundation, P.O. Box 27080, Central Station, Washington, DC 20038; $48.25). You can find round-head windows, suppliers for hard-to-find hardware, and just about anything else related to windows in this publication.

## Energy Upgrades

For early houses with small-paned sash, stay away from thermopane replacements with wide muntins. You'd never see wide muntins on early or even Victorian houses. And never use snap-in plastic or wood grilles in place of divided lights. They never look like the real thing.

To make the windows more energy efficient, use metal weatherstripping (Accurate Metal, 725 S. Sulton Ave., Mt. Vernon, NY 10550; 914/668-6042.) Excellent interior storm windows (which also provide energy savings) can be found in *The Window Handbook*. If you use a good storm window, you won't have to remove the original sash to improve the energy efficiency of the window. ■

*Christopher Wuerth's company, C. Wuerth Restoration Contractor in New Haven, Conn., specializes in preservation and restoration of early frame buildings.*