

Reglazing Windows and Doors

Replacing glass in wooden frames is painless with the right tools and techniques



Sharp as a razor. Shards of broken glass are incredibly sharp, and special care needs to be taken when removing these pieces from the frame.

An old tool with a new job. A bottle/can opener with a sharpened point works great to scrape out the most stubborn old putty that hangs on to the wooden frame.



by William T. Cox Jr.

I recently remodeled an old home 20 miles outside of Memphis. I needed to head back over to the place to finish off a small punch list. Among the items on the list were a couple of panes of glass that needed replacing. The broken panes were in the wooden double-hung windows in the front of the house, plus a pane broken out of a wooden side door. The job wasn't big enough to call in a glass company, so in addition to my regular tools, I loaded my van with some stock sizes of single-strength glass, a box of points and a can of glazing compound.

Gloves may help in removing broken glass—Reglazing is simple as long as the proper tools and techniques are used. The first step is removing the broken pieces of glass as carefully as possible, remembering that the edge of broken glass is sharper than any cutting tool (photo above left). OSHA recommends that gloves be worn at all times when handling glass, but having learned how to handle glass from my uncle, I feel safer being able to feel the glass with bare hands. A lot of the glaziers I've talked to swear by the gummy gloves that are made for handling

glass. The debate over gloves will probably go on forever, but there are no good reasons for not wearing eye protection. Safety glasses or goggles should be worn at all times, especially when removing the glass shards of a broken pane.

After all of the loose pieces of glass are taken out, I remove the old putty. If the windows haven't been reglazed in a while, the putty usually separates from the wood fairly easily. If the old putty is stuck to the wood, a sharp utility knife and small scraper will remove it. I also carry an old bottle/can opener to get rid of hardest stuff (photo above right). The sharpened point of the opener will get into even the smallest cracks.

While removing the glass and old putty, I often come across tiny, flat, diamond-shaped pieces of metal. These things are glazing points, shot into the frame at the factory by a tool similar to a stapling gun. Glazing points hold the glass in the openings of the frames. The putty or glazing compound is meant only to seal the glass from air and moisture infiltration. Without the points the glass would simply fall out over time. Factory points can be saved and put back in, but replacement points are cheap and go in easily.

When the opening is cleaned to the bare wood, I measure it side to side and top to bottom and deduct $\frac{1}{8}$ in. in each direction for the glass size. The top panes in the bottom sash of a double-hung window are the exception to this rule. The bottom sash has a slit running along the top stile for the panes to slide into. The top-to-bottom measurement for these panes needs to be $\frac{1}{8}$ in. larger than the opening. One-eighth in. of play in each direction should work for all openings that are straight and true. For windows that are badly out of square, I need to figure out whether it's best to replace the broken pane, replace the sash or buy a whole new window.

If more than a couple of panes of glass need replacing, it may be more convenient to take the sash out and repair them on sawhorses. Be aware that removing the sash will create additional work because the sash stops, cords or universal slides will need to be removed, and the inside trim will probably have to be repainted later.

A little light oil makes glass cutting a lot easier—I'm a little leery of hardware stores that sell glass on the side. These places have a con-



A good cut starts with the right grip. Holding the glass cutter properly is the first key to successful cutting. Apply even pressure and draw the cutter back with a single smooth, continuous motion.



Cutting glass is a snap. After scoring the glass, grip it on both sides of the score mark and apply firm pressure. The pane should break smoothly along the score.

traption that aligns and cuts the glass in one smooth motion. However, I've gotten glass cut on these machines that was so out of square that it wouldn't fit into the opening. A glass shop has all of the equipment needed for precise glass cutting: a flat, cushioned table; a selection of T-squares; oil; and, of course, the best glass-cutting tools. But because there were only a few pieces of glass to install for this project, I decided to cut my own glass on a table made from a piece of plywood on top of my sawhorses. I used an 18-in. ruler for a straightedge.

Glass cutting always goes a lot easier with a very sharp cutting wheel on the glass cutter and a little machine oil. Until the late 1960s, glass cutters were expensive and made with replaceable cutting wheels. Now, with the whole tool costing only a couple of dollars, I keep a new glass cutter handy for each glazing job I do. The machine oil lubricates the cutting wheel, and a little oil laid on the glass just before cutting will prevent a "hot" cut (chunks and shards of glass splintering from the scoring).

Cutting the glass to the right size the first time will save a lot of headaches. Thin strips of glass are difficult to take off with a glass cutter. If I need to fine-tune a glass cut, my belt sander with a 120-grit belt will take off small amounts.

The proper grip on the glass cutter will also help with getting a good cut. Most glass cutters should be held with the handle between the middle and index fingers and the tip of the index finger and thumb gripping the handle just above the cutting wheel (photo top left). If this position feels too odd, hold the cutter like a pencil; either method will give excellent control of the tool.

Start with the cutter wheel at the edge of the glass and press down until the wheel digs in

slightly. Then, with a smooth and continuous motion, score the glass, listening for a long, even, rasping sound as you cut. It's the same principle as hitting the perfect golf shot: It has to be right the first time.

Marks on glass are tough to see and rub off easily, so when I'm ready to cut a piece of glass, I measure with a steel tape and move my straight-edge to get the measurement without making marks on the glass. I adjust my measurement to allow for the thickness of the glass cutter, dip the cutter in oil and score the glass once and only once. Scoring the glass more than once may cause it to shatter, or the cut will be ragged at best. Then I pick up the sheet of glass quickly, gripping each side of the score mark with my thumbs on top and index fingers underneath. I apply firm pressure on both sides of the score mark and snap the glass (photo top right). It's necessary to snap glass quickly once it is scored, because glass is a supercooled liquid. Scoring the glass disturbs its molecules, and the glass will snap more readily while the molecules of glass are still moving around.

Give the bare frame a coat of linseed oil before glazing—I always dry-fit the pane and then lay it aside. With a rag I rub a good coat of linseed oil on all bare wood surfaces (photo bottom right). Linseed oil is a vegetable oil and one of the main ingredients of glazing compound. Linseed oil refreshes the wood and stops the oil from being wicked out of the newly applied putty. Some folks recommend priming the bare wood with latex paint. I think this does more harm than good because it provides a path between the putty and the wood for air and moisture to get in.



Prep the bare wood with linseed oil. Linseed oil refreshes the wood and keeps the wood from drawing the oil out of the putty.

I dig out a wad of putty about the size of an egg and knead it until it becomes warm and pliable (photo top left, facing page). If the original piece of glass was back-bedded, I apply a thin layer of putty on the inside lip of the sash (or muntins) and then press the glass into the putty. Next I install two glazing points along each side of the glass pane (photo top right, facing page). I roll the putty between both hands until it resembles a short piece of thick rope (photo bottom left, facing page) and work this putty rope into the angle between the glass and mullion. I apply a liberal amount of putty along all four sides with my fingers before I get out my putty knife.

The putty knife should be as clean and as smooth as possible, which is why a lot of them are made with chrome-plated blades. The blade of the knife should also be flexible. With the put-



Warming up the putty. Knead a ball of putty about the size of an egg to warm it and make it soft and workable.



A putty rope is easier to work into the frame. Roll the putty between your hands, and use your fingers to press it into the sash.



Glazing points are pushed in with a putty knife. With the glass set in the frame, glazing points are inserted to keep the pane in place. Tiny vertical tabs on the points let you use a putty knife to push the points into the wood.



A smooth putty knife removes the excess. Drawing a smooth, clean putty knife along each side of the window at the proper angle presses the compound into place, smooths it out and takes off any excess. The proper angle is determined by the height and depth of the rabbet.

ty knife, I press the glazing compound into place as I smooth it out and remove the excess putty (photo bottom right). If the putty knife isn't smooth and clean, it will pull the putty away from the wood. Proper technique is the secret.

I hold the putty knife at a slight angle to the frame, and with a steady backward stroke, I "wipe" the putty into place. The putty knife cuts away any excess, and at the same time, the blade pushes the glazing compound in at the proper angle, which is determined by the height and depth of the rabbet. The best way to smooth any remaining bumps or to close small cracks is to rub the putty lightly with your finger, which builds up a little heat and softens the putty slightly. Rubbing the putty with your finger also brings a little oil to the surface, which I believe aids in the curing of the glazing compound. After I'd fin-

ished glazing all of the new panes in the double-hung windows on the front of the house, I moved on to the side door.

Door lites must be replaced with tempered glass or acrylic—The three-lite, three-panel door had been installed in the 1950s when the house was built, and vandals had recently broken one of the panes. Back in the 50s, door glass did not have to be tempered. However, in 1977 a federal law was passed, mandating that all glass in and up to 1 ft. away from a door be tempered glass or acrylic sheet. It's up to the states, of course, to enforce the law, and here in Tennessee, the law states that anyone buying plain glass must sign a paper stating that the glass will not be used in a door. Before you replace any glass in a door, check your local codes and the

laws concerning door glass, but never use plain glass in a door.

As in most wooden doors, the panes of glass were held in place by wooden stops. With my utility knife I cut the paint away from the seams, or the wooden stops would never have come out in one piece. Tempered glass is impossible to cut, so I had to order the sizes I needed from a local glass company that specializes in tempered glass. After putting a small bead of silicon caulk on the back lip of the rabbet to keep the glass from rattling, I installed the glass and replaced the wooden stops, using 1-in. brads to hold them in place. □

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