

Leaded glass made easy

BY MICHAEL PEKOVICH

For the Arts and Crafts display case on p. 30, I made doors with leaded glass. Not only is leaded glass attractive and true to Stickley furniture, but it's also simple to make and an alternative to glass panels divided by wood mullions. The simple pattern on these doors is a great introduction to the craft, but the techniques apply easily to more intricate designs (see "A technique for tight curves," p. 91).



Choose your glass first

You will need a few special tools and materials to make leaded-glass panels (see box, below). For the panes, I chose a slightly distorted glass ($\frac{5}{16}$ in. thick) that my local glass shop referred to as restoration glass. There are a lot of glass options available online and from stained-glass supply stores, but for this display case, stay away from anything too textured or bubbly. Clear plate glass would be better than something that draws too much attention to itself.

The process of making a leaded-glass panel involves cutting the glass into

WHERE TO BUY GLASS SUPPLIES

www.delphiglass.com

- Glass cutter:** \$6 and up
- Soldering iron:** \$22 and up
- Solder (60/40):** \$12 per lb.
- Glasflux:** \$6
- Horseshoe nails:** \$12 per 100
- Inland black cement:** \$8
- Whiting powder:** \$4
- Lead nipper pliers:** \$9
- Lead vise:** \$6
- $\frac{1}{4}$ -in. lead came:** \$5 per 6-ft. strip
- $\frac{1}{4}$ -in. zinc channel:** \$3 per 6-ft. strip

Cutting glass cleanly

Although a steel-wheel glass cutter from a hardware store will work, you'll get better results with a diamond-wheel cutter.



STEEL-WHEEL CUTTER

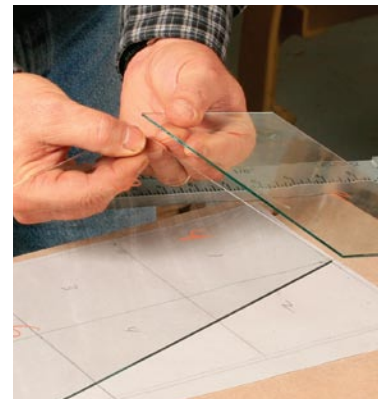
DIAMOND-WHEEL CUTTER



Oil is a must. Without lubricant, the kerf cut into glass will want to close up, leading to a coarse edge. A simple steel-wheel cutter gets dipped (left), while a self-lubricating cutter gets filled (right).



Use a full-size pattern as a guide. A drywall square ensures a straight, square cut. Make one pass only, pressing hard enough with the cutter to hear a slight crackling sound. Offset the cuts $\frac{1}{16}$ in. inside the lines to account for the lead came.



Breaking up isn't hard to do. With a properly lubed cutter, the glass should snap apart cleanly after scoring.

For even more details, watch our slide show at FineWoodworking.com/extras.

Assembly: Follow the pattern

1/4-IN. ZINC
U-CHANNEL

1/4-IN. LEAD
CAME

The glass panes are installed between sections of lead came. The entire assembly is framed with zinc channel.



Clamp and pull. The lead-came strips are flexible when shipped. To straighten them and make them rigid, you need to stretch them. Put one end in a lead vise (above) or other clamp and pull hard on the other end.

small pieces and reassembling them between strips of lead called came. Lead came is available in a few profiles, but for this panel I used a simple H-profile. Surrounding the assembly is a U-shaped zinc channel that adds some rigidity to the panel. After assembly, the joints are soldered, and cement is forced between the came and the glass pieces. Finally, the came is buffed, which has the added benefit of darkening the lead.

Use a template to cut the glass

It's always best to start with a full-size pattern of the glass panel. In this case, it's easy enough to lay the glass on the pattern and use it as a guide to cut the rectangles. For ornate designs, I'd transfer the pattern onto heavy paper and cut the pieces apart to use as individual templates for the glass. When cutting the



Square from the start. To keep the glass panel square, assemble it on a right-angle jig, placing the full-size pattern underneath.



Corner first. Slide the first piece of glass into the zinc channel. Snug a short section of came against the glass and use it as a guide to cut the horizontal section of came to length.



One row at a time. Tack the glass rectangles in place with horseshoe nails, using short pieces of came as a cushion. Horseshoe nails (far right) can be removed and reused.



Secure the frame. Once all the panes are in place, install the last two sections of the zinc frame. Use horseshoe nails to prevent the assembly from shifting.





Solder the joints

To achieve a smooth solder joint, let the soldering iron heat until the solder melts easily and doesn't stick to the iron.

rectangles, offset the cuts $\frac{1}{16}$ in. inside the pattern lines to allow for the $\frac{1}{16}$ -in.-thick rib inside the lead came; otherwise, the panel will end up too large.

As you cut the glass, number each rectangle to correspond with the numbers on the pattern.

Right-angle jig is the key

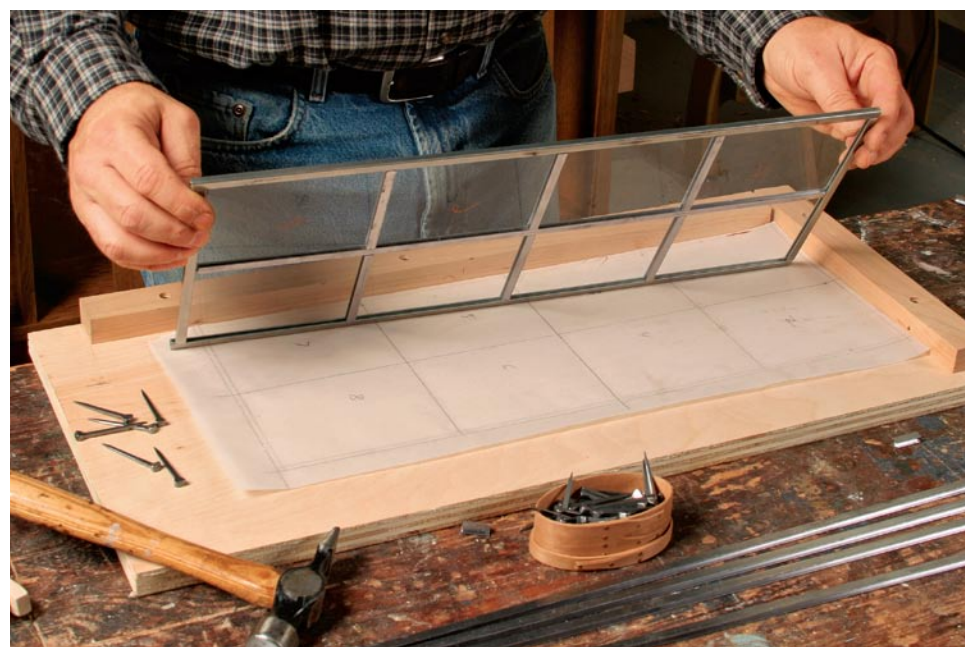
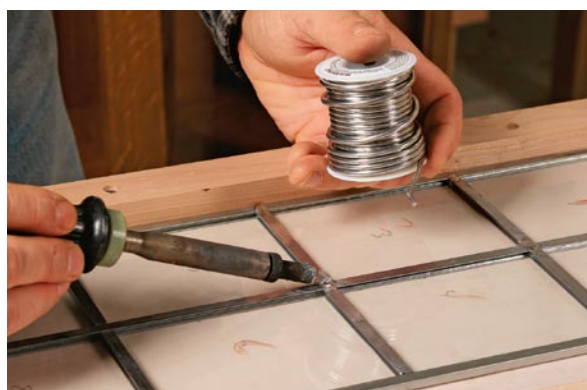
To keep the panel square during assembly, use a jig with a $\frac{3}{4}$ -in.-thick plywood base and two fences that meet at a right angle. Trim the pattern along two adjoining edges and place it against the fences of the jig. Then cut the zinc border to length and place two pieces



Flux first. Flux cleans the joint before soldering. It also helps the solder to flow more easily when it's melted, making a better-looking joint.



Solder on. Melt some solder onto the iron (left), and apply it to the joint (right). Do not leave the iron in contact with the came too long or it will melt the came and create a gap.



Do the second side. Once the joints on one side have been soldered, remove all the nails along the border and carefully flip the panel to solder the other side.

against the fences. Put the first piece of glass in the corner, securing it with a horseshoe nail and a short piece of came.

Cut a piece of came to length, place it along the side of the glass, and install the second rectangle. Continue until the first row of panels is completed. Cut the center strip of came to length and install it and the second row of panels. Once the last two pieces of zinc border are secured, solder the joints on both sides of the panel.

To cement the glass in place, you can use glazing compound, but I prefer the dark look of black cement. Apply the cement liberally, brushing it into all crevices, then use whiting and sawdust to solidify the mix and to clean the glass. Do both sides of the panel.

When the glazing is complete, the panel is ready to be installed in the door. □

Glaze the panel

Use black cement to fill any gaps and make the panel more rigid. Whiting firms up the cement and helps clean the panel.



Apply the cement liberally, then sprinkle on whiting. Use a stiff bristle brush to work the cement into the gaps between the came and glass (right). Sprinkle on the whiting and rub it in (far right). You can use plaster of paris in place of the whiting.



Burnish with sawdust. The final step is to pour sawdust on the panel and brush (far left). This step not only helps clean the glass, but it also darkens the lead and the solder joints. The more you brush, the darker the look. Use a thin stick to remove excess material in the corners (left).

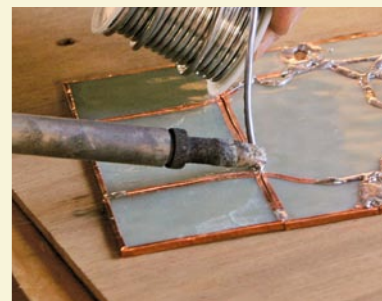
A technique for tight curves

I use a different technique to make intricate designs such as the glass panels on these Greene-and-Greene lanterns. First, make a full-size pattern of the panel and cut individual patterns for each piece of glass.

Instead of assembling the glass pieces using lead came, wrap the edge of each piece with adhesive-backed copper foil. Once all of the foil-wrapped pieces are in place, melt solder onto the copper. This technique requires much more soldering than the lead-came technique, but it's easy to assemble and doesn't need to be glazed. Typically a chemical patina is used to darken the solder lines.



Wrap and fold. Run adhesive-backed copper foil around the edge of the glass and fold it over onto the face.



Flux and solder. Assemble the pattern and brush flux onto all of the copper foil. Then apply solder along every joint line.