# Stained Glass 101

## *hands-on info for the hobbyist*

by Brian McMillan

### Preparing Your Pattern For Soldering

After you have cut, ground and foiled your stained glass pieces, the objective is to solder them together so that they are true to the pattern. This can be a challenge, and the goal isn't always achieved easily. If you are building a free hanging stained glass panel, a small discrepancy may not be an issue. However, if the panel must fit an exact opening, or if you are building a lamp or other 3-D project, it is critical.

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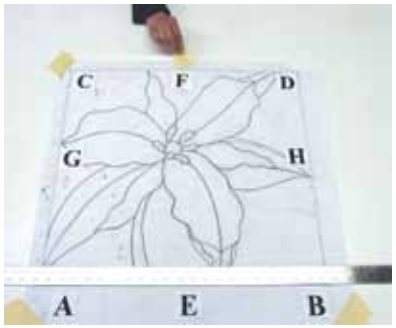
If you draw your own pattern, paper selection is very important. You need to use paper which is stiff enough so that it will lay flat when you are ready to solder. I use an architectural paper called drafting and drawing fade out vellum. It is tough (doesn't tear easily), will accept some contact with water without wrinkling, and it is quite transparent, which is great if you are cutting on a light table. It comes with squares printed on it (10 per inch) which is a big asset when you are drawing your pattern. Leave an extra 2" of paper around the outside of your design.

No matter what paper you use, it is critical that it not come in contact with water. Once a paper pattern is wet, it will warp and it will not lay flat on the work surface. To avoid this, you can have the pattern laminated, dry off your glass piece each time you place it on your pattern, or place a sheet of stiff plastic—such as an acetate used on an overhead projector—on top of the pattern when you place your wet glass on the pattern for fitting.

Here is an example of how I lay out a pattern on my work table. Use 2" masking tape to tape down corner A of the pattern to your work table. Place another piece of tape on corner B of the paper. Pull on the tape to stretch the paper taut and adhere the tape to the table. Place a metal ruler along the outside line of your pattern to see if the line is straight. If it is not, you can correct the problem by adhering a piece of tape to point E or F, pulling until it is straight and adhering the tape to the table. In the previous photo, I am stretching the paper toward F to pull up the bottom line.




Place a T-square along the bottom and left side of your pattern. Place a piece of tape on corner C and pull as needed to square up corners A and C. If needed, place tape at points G and H and stretch. Repeat this on the right hand side. Your piece should now be square.

### Panel Lamps and Other Small Panels

For small panels, lamp designs, etc., the most important points are to keep your pattern dry and to use the same process to stretch the pattern straight. I have found the Morton Lay Out Block System to be invaluable when you are preparing to solder together the panels of a small stained glass project such as a lamp. It consists of assorted L-shaped aluminum strips of different lengths. One side has small holes drilled every 1½". Tape your pattern down to a soft board such as drywall or an acoustic ceiling tile. The system includes aluminum push pins which are placed in the holes to surround your project and keep glass from moving around while you are soldering. Since everything is aluminum, solder won't stick to it. Place one strip along the bottom and two strips along the sides of your lamp pattern. Often there isn't enough space at the top for even a short strip, so I just use a couple of push pins pushed part way into the pattern. The above photo is an example of a lamp pattern which is ready to accept the glass.

It is a good idea to place these strips around your pattern before you start grinding. With a project such as a lamp or vase, it is critical that all the sections are exactly the same size. Grind a section to fit the pattern, place it aside, and grind the remaining sections without removing the Lay Out strips to ensure that all are identical. Remember not to get your pattern wet. Once all of the pieces are foiled, place them back in the jig with the Lay Out strips. Tack solder them together in the jig and then remove them to do your finished solder bead. If needed, pull out the pins at the top of the pattern so you can get your fingers around the piece to remove it. Place the pins back in the same holes for the next section.

### Doors, Windows and Odd-Shaped Panels

If I am working with a larger project such as a door insert, I use wood stops rather than the Lay Out Blocks. I find that oak "door stop" — available at your local lumber yard — works great. It stays straight, lasts a long time and is reasonably priced. When squaring a large pattern, you follow the same process as described previously, except that once the corners are taped down, you will have to stretch the paper in more than one spot.

When working with circles, ovals or odd-shaped suncatchers, tape the pattern as flat as possible on a ceiling tile, then use the Morton aluminum push pins to hold the glass during soldering, as shown here. If the pattern is larger than a ceiling tile, I tape the pattern to my plywood tabletop and use finishing nails around the perimeter to hold the glass.

Hopefully, this information will help make your next project hassle free.

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