How to Make
Stained Glass Boxes

by
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Materials:

♦ Work board, push pins, pattern paper, marking pen, scissors, needle-nosed pliers, steel wool (fine)
♦ Glass, including mirror glass for the box bottom, if desired.
♦ Copper Foil, including ¼”
♦ Solder
♦ Flux
♦ “Rod and Tube” hinging
♦ Box Chain
♦ Clear adhesive (“Contact” paper or?), or adhesive-backed felt for box bottom
♦ “T-Square” or guide to establish right angles
♦ Rheostat

Directions:

1. **Box TOP**

These instructions are for a multi-piece top, not a single piece of glass.

The sides and box bottom will be built to the size of the box top, so the top should be completed first.

Create a box top (a small panel). As with any panel with right angles, if the piece is a square or rectangle, make sure it is squared off (all four angles are 90-degree angles).

To give the top a smooth finished look, foil the inside edges of the pieces (not the border edges), pin them on the work board and solder them together, front and back. Clean the piece well, then foil the outside edge all around using a wider piece of foil (1/4”) than that used on the inside edges. Solder the outside edges completely. Clean again to remove flux.

**TIP/REMINDER:** When selecting the foil for any clear or transparent glass piece, the backing on the foil should be the same color (silver, copper or black) as your finished solder.
2. **Box SIDES and Work Board/Jig:**

   A. Tack a piece of paper which is larger than the box top to a work board.

   B. Trace the outline of the completed box top on the paper. Set box top aside.

   C. Using “Morton” layout blocks or a similar guide, or jig, tack the blocks or jig pieces along the outside of the lines on the paper. This will assure that the box does not “grow” during the assembly process.

   **D. Cut the Box Sides:**

   To determine the **length** of the box sides, they should fit **inside** the **jig**, as follows:

   ![Diagram of box sides inside jig]
Using a strip cutter or a cork-backed ruler as a guide, cut the glass to be used for the sides to the desired **Height**.

Next, cut the strip with the hand cutter to the proper **Length** for each of the side pieces using the following guide.

Place your sides **within** the layout blocks to determine their correct length. Masking tape may be used to hold them in place during this measuring process and push pins may also be placed on the box **interior** to hold the sides upright.

(Picture shows pieces already tinned.)

**E. Assemble** the Box Sides:

1. Once the box sides have been properly sized/fit within the layout blocks, clean and foil the pieces.

2. Tin each of these box side pieces on all surfaces.
TIP: If you plan to patina the side pieces and they are clear or transparent glass, apply the patina to the foil after you have tinned the pieces. Wash the pieces after applying the patina to remove any patina residue from the glass.

3. Place the pieces back inside and tightly against the layout blocks/jig. Masking tape may be helpful to hold the pieces correctly in place. Tack solder at the four corners to hold the pieces together in their proper positions.

4. Remove the glass from the blocks and complete soldering the exterior seams.

   NOTE: Lightly solder/do not completely fill in half way down the two back corners. (The rod from the rod and tube hinge will be soldered into this “seam” and room should be left for the rod and the solder that will hold it in place.)

5. Flux and solder the inside seams of the box sides.

3. **Box BOTTOM:**

   A. Place the completed box sides on top of the glass you will use for the box bottom and, using a marking pen, trace around the INSIDE of the box sides onto the box bottom glass.

   B. Cut out the box bottom, staying to the outside of the tracing line. Grind the box bottom piece until it fits inside the box sides.

   C. Clean, foil and tin all surfaces of the box bottom. (If using mirror glass or the bottom, use silver backed copper foil.)
4. **Assembly - Box Sides to Bottom:**

   A. Place the box bottom inside the box sides.

   B. Box inside bottom: Flux all four corners and drop a small amount of solder in each corner to further reinforce. Optional: Flux and solder the box bottom to the sides.

   C. Box outside bottom: Flux and solder the box bottom piece to the box side pieces.

5. **Assembly - Box Top Hinge to Box Top and Sides:**

   Rod & Tube Hinge

   The **tube** part of the “rod and tube” hinge is soldered to the back edge of the box top and the **rod** is soldered into the back side corners of the box as follows:

   A. Measure the tube to determine length. The tube should be the length of the box top back edge less approx. 1/8” to 3/16” on each end.
Length of Tube

B. Mark the tube at the desired length, and, using a metal file, file the tube with the edge of the file just slightly so as to start the “cutting” process. Using a pliers, bend and break the tube and file off any rough edges with the file.

C. Clean the tube with steel wool and insert toothpicks into each end of the tube. Turn your rheostat up approx. 5°. Flux and tin the tube (use pliers to hold it!). Turn rheostat back to normal temperature setting.

D. Solder the tube onto the back of the box top back edge, as follows:

Place the box top face side down on your work board and pin it in place on 3 sides. With the toothpicks still inserted in the ends of the tube, center the tube along the length of the back of the box top and hold it in place with several push pins. Flux the tube and box edge. Tack solder the tube onto the box top at several places. Remove the pins on that edge only. Using a tool such as the metal end of a flux brush, push the tube against the box top while soldering the full length of the tube. Solder should fill in any gaps between box top and tube and be smooth. Solder both top and bottom sides of the box top/tube seam. Remove toothpicks from the tube ends and discard.

E. Measure the length of the two rods (or one, for a small box). They should go into the tube approximately 1/3 of the tube’s length and down the back corners of the box approx. 1/3 – 1/2 way. (If one rod is used, it should be the length of the back of the box BOTTOM plus the added length of the distance it goes down the two back side edges of the box.) Cut the rods using the same technique as for the tube. (See B. above.)

CAREFULLY AND SLOWLY bend the rods with a pliers to a 90-degree angle using the distance down each back side edge as a guide for your bending point.
F. Clean the rods with steel wool, flux and tin up to the point where the rod enters the tube.

G. Place the bent rods into each end of the tube on the box top. Place a paper towel piece between the box top and bottom at the edges (where you will be soldering the rods into the box sides). This will prevent solder from flowing onto the box bottom or top instead of into the box corners.

**TIP:** 16-gauge wire may be used in place of the rod.

H. Position the box top onto the box aligning the tube and rods into the rear box corners. (The box top will extend over the front of the box slightly.) Using rubber bands or a steady hand to hold the top and bottom in place, flux and solder the rods into the back corner edges.

6. **Box Top Chain (optional, depending on box size)**
A. **Measure and Cut**: Box chain should be cut to a length slightly longer than what would allow the box to open just past the fully upright position. You do not want the top to slam down (chain too short), nor do you want it to open too far and possibly cause the box to tip backwards (chain too long).

B. **Solder**: Flux and drop a small amount of solder on approx. ¼” of both ends of the cut chain. Using a small pliers, hold the chain and solder it into either of the front box bottom corners. Then, again using the pliers, solder the other end to the inside top of the box near the back and set in from the edge far enough that, when the box is closed, the chain sits inside the box.

![Image of a box with chain attached]

7. **Clean & Polish**

Clean the box with flux remover and dry. Using a metal polish or a finishing compound, polish all solder surfaces on the box.

If you are going to apply a patina, do not polish after cleaning. Clean your piece very thoroughly with the flux remove and dry it. Apply the patina. Let it dry and then rinse the piece and dry it, paying special attention to removing any patina on the glass. Should you decide to polish the patina, note that the polish will remove some of the patina and give it a shinier look. Patina can be removed with fine steel wool and additional patina can be applied. One color of patina may also be applied over another to achieve a unique color.

8. **Finish Box Bottom**

Apply either clear “Contact” paper, or self-adhesive felt (Wal Mart, crafts stores) to the box bottom. You may choose, instead, to use the rubber-like cabinet pads or
bumpers and apply them to the bottom corners to act as feet. They are available at hardware stores in a variety of sizes.

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