Preparing Thin Gauge Sheet Copper To Minimize Warpage As It Is Enameled

By Edmund Massow

If you work with copper sheets that are larger than 25 centimeters, you must either work with heavier gauge copper or you must stress the metal to minimize warpage. The following is a method of preparing thin gauge copper to minimize warpage.

Cut the thin gauge copper sheet 1.0 cm longer and wider than your design calls for. If it is soft copper it isn't necessary to anneal it. However, if it is a hard sheet, it must be annealed. To anneal, heat the sheet in your furnace until it turns dark red. Remove it and douse in cold water. Remove all firescale.

Scribe a line around the sheet .5 cm from each side. Then cut away the four corners as shown in Fig. 1. Fold each side at a right angle to the main part of the sheet along the scribed line (see Fig. 2).

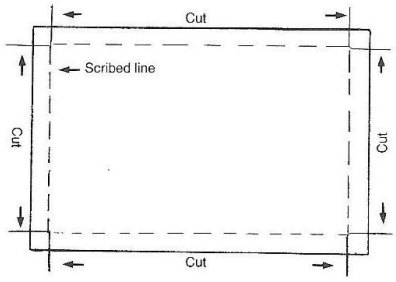

Fig. 1.

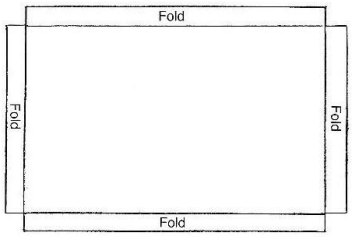

Fig. 2.

The next step is to harden the whole surface. Lay the sheet onto a hard surface with the newly formed rim facing up. Chase with a middle great ball-pein hammer in parallel lines to the length and width of the sheet. The strokes should be very uniform (Fig. 3).

With a swagging hammer, harden the corners of the sheet. To do this, imagine a diagonal line that runs from one corner to the opposite corner. Now hammer strokes that are at a 45 degree angle to the diagonal on the left and right sides of the diagonal at each corner (Fig. 4).

Next the inner rim of the sheet should be hardened. With the swagging hammer, set hammer strokes across the inner rim (Fig. 5).

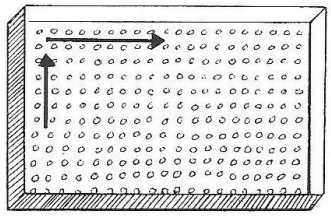

Fig. 3.

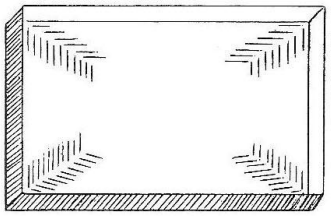

Fig. 4.

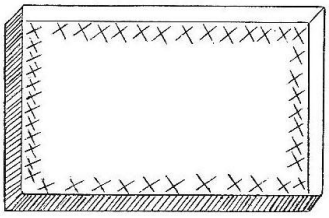

Fig. 5.

The copper plate is then slowly heated again in a furnace. When the plate is dark red, remove it from the furnace and let it cool very slowly. Do not put the sheet in water, otherwise the desired effect of tension is lost.

Clean the plate of firescale and place it on a hard surface with the rim facing upwards. Smooth the surface by rubbing hard with a planishing hammer. Turn the plate over and check to see that the bottom of the rim sets flat and level to the top of the hard surface. Proper planishing should have raised a slight dome to the front of the plate. If you press the middle of the dome it should lightly spring back. If you want to grind and polish your finished enamel, such a domed surface is easier to grind than a flat one. Another advantage is that in firing, the copper sheet can be fired directly on a grid with out special trivets. The bottom edge of the rim is all that touches the firing rack.

Counter enamel the backside and proceed to enamel the front. It is advantageous to keep the final enamel thickness to a minimum. ■