ADD ENAMELED ACCENTS TO YOUR TURNINGS

White Ash Bowl with Enameled Tiles, 2013, White ash, enameled tiles, 5¾" × 8½" (15cm × 22cm)

Wes Jones

I am always looking for something new to make my pieces different and interesting. Over the years, I have used cut art glass pieces, metals, contrasting woods, rock nuggets, crushed minerals, beads, fossils, and shells to decorate bowls and hollow forms. Given the materials I have tried, using enameled pieces on my turned work was a logical next step. Enameling involves melting glass and fusing it onto a metal substrate. You can enamel on gold, silver, and copper. The usual method is to sift finely powdered glass onto the substrate and fire the blank in a temperature-controlled kiln, but that is not the only method of firing.

I have always wanted to add the brilliant colors you can get by enameling, but I did not have a kiln to melt and fuse the glass. Then I learned, through a weekend enameling course at John C. Campbell Folk School, that it is possible to do the firing with a torch. Ah, ha!

I had so much fun at the enameling course that I later took a week-long course on the subject. I started out like the rest of the class, making simple jewelry pieces, learning the techniques, and building my skill level. When I took the two courses, I arrived at class with a couple of bowls ready for the enameled tiles. The bowls had a ¾"- (19mm-) high recess cut around their periphery to receive the enameled tiles.

Cut and form the substrate

I use 24-gauge sheet copper (.021" thick) as the substrate because it is much cheaper than other metals. The underside of the tiles will never be seen, so there is no reason to use precious metals as a substrate in this case. For the first bowl I made with enameled tiles, I cut the copper blanks ¾" × ¾" square. When you cut the recess, you can cut it flat from top to bottom, but it will obviously curve as it goes around the bowl. When I tried fitting the square blanks into the recess around an 8" (20cm) diameter bowl, I found the copper blanks needed to be formed into a slight curve to conform to the curve of the bowl. To make curved tiles, you will have to bend or form the copper blanks before you fuse the glass to them. If you try to form a completed tile, the glass will crack and break away from the substrate.

Twenty-four-gauge sheet copper is easy to bend, so you can shape the blanks with only finger pressure against a curved surface. I used a curved surface with a slightly smaller radius (tighter curve) than that of my bowl, so that with a little spring back my formed blank would then closely match the curve of my recess.

Annealed or soft copper sheet will form more easily than hard or half-hard copper sheet.

For my second and all my subsequent bowls, I decreased the width of the copper pieces to avoid having to shape them. I made the blanks narrower so the flat pieces would more closely conform to the bowl's curved surface. I found that flat blanks ⅝" (16mm) wide work nicely around an 8" diameter bowl.

To cut the copper pieces in my shop, I bought a small, inexpensive metal shear (*Photo 1*). It is not much more than a toy and will only cut 8"-wide material, but it works well for this application. If you do not have a shear, the copper sheet can be cut with tin snips. The strips need to be cut precisely with uniform width and clean edges. It may be possible for you to find someone with a shear to cut the blanks for you, or you can order them from a jewelry supplier.

Cut ten to fifteen percent more blanks than needed to allow for some failures and rejects during enameling. I suggest you also make a few slightly narrower blanks, so that you can completely fill the recess around the bowl without large gaps. Sometimes despite careful measuring and cutting, you might end up with a gap and having a few odd-sized tiles helps resolve this issue.

Bowl preparation

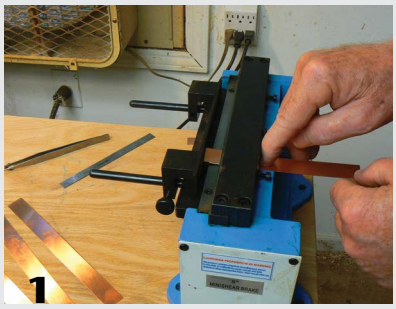
The procedure is to completely turn a bowl from a dry blank, complete with foot and recess. The bowl should be sanded, signed, and finished, except the recess should be unfinished.

The shape of the bowl or hollow form needs to be such that the recess can be cut on the largest diameter with the bottom surface of the recess parallel to the axis of rotation. This will ensure the circumference of the upper edge of the recess is approximately the same as the circumference of the lower edge. To cut the recess, hold the bowl or hollow form in a chuck or between centers. The workpiece must run true and without wobble to get a recess with uniform depth. Use a parting tool to make a flat-bottomed recess. A small square scraper can be used to carefully flatten the bottom of the recess (*Photos 2, 3*). Make sure the scraper is angled down and take very light cuts. The recess can be pretty shallow, just deep enough to capture the copper blank. I like the enameled pieces to protrude slightly above the recess.

To determine the number of tiles required, measure the circumference of the recess with a flexible measuring tape and divide by the width of your tiles. For instance, if the circumference is 25" (64cm) and your tiles are ⅝" wide, you will need forty tiles. Dry-fit the copper blanks in the recess to ensure they have a slightly loose fit top to bottom.

Cleaning the copper blanks

The copper needs to be clean and free of oil. There are several methods you can use to clean it, but the simplest is to heat the sheet with a torch to burn off any oil and then scrub the surface with a fine abrasive pad, pumice powder, or scouring powder. If the copper sheet is bright, you may not need to do any cleaning, other than heating. Be careful to handle it by the edges to avoid leaving fingerprints on the surface.



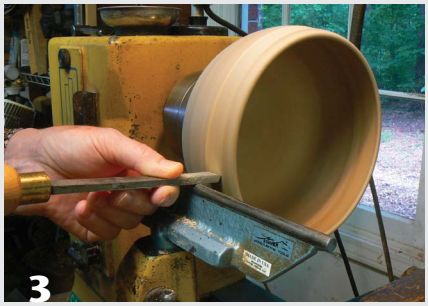
A small metal shear with an adjustable fence works well for cutting copper blanks.

Enameling procedure

If your copper blanks have a sharp edge from the cutting operation, make the surface with the sharp edges the underside and apply the enamel on top. Place the blanks on a clean sheet of white paper separated from each other on a worktable. To make it easier to pick up the blanks by the edges, you may want to lay out some sort of small spacers, such as small hexnuts, and place each blank on its own little pedestal.

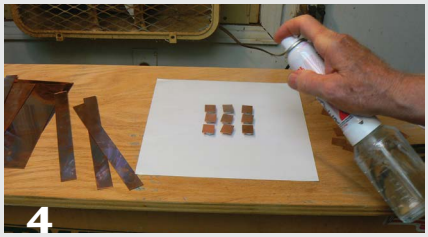
Spray the blanks with Klyr-Fire™ adhesive solution (50% mixed with water). The Klyr-Fire™ acts as a bonding agent to help the melted glass adhere ▸

Turn a recess

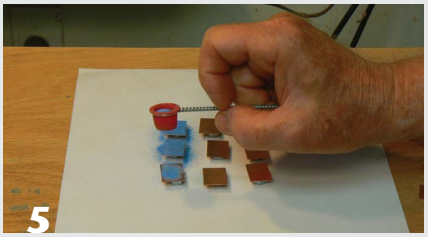


Use a parting tool to create a dado recess for the tiles. Clean up the recess with a small square scraper.

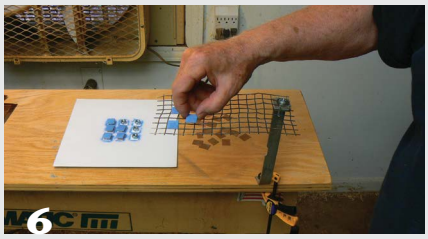
Prepare and fire the tiles



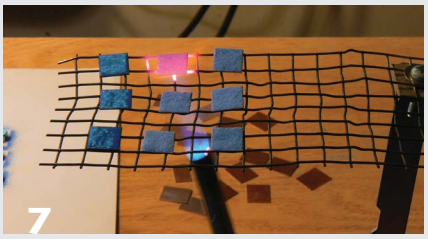
Spray the copper blanks with Klyr-Fire™ using a compressed-gas hand sprayer.



Use a small enamel sifter to cover the copper blanks with powdered enamel.



Place the tiles on the stainless-steel grid so the enamel can be fired.



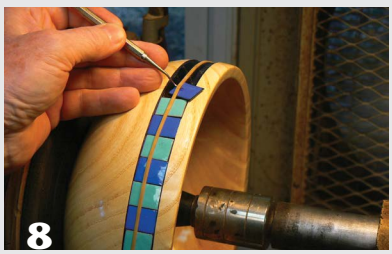
After the tiles are dry, apply flame from a MAPP torch from under the tiles. Heat the enamel to a molten state so it will bond to the copper substrate.

to the substrate (*Photo 4*). I use a small compressed-gas hand sprayer to mix and apply the 50% Klyr-Fire™ solution.

Now it is time to put your enamel onto the prepared copper substrate. I use 80-mesh, ground-glass enamel from Thompson Enamel, Inc. (thompsonenamel.com). The mesh number is a measure of how finely ground the glass particles are. While the Klyr-Fire™ is still wet, use a small enamel sifter to put the enamel evenly onto each blank. The sifter has a twisted wire handle and by scraping your fingernail along the handle, the vibration will cause the enamel to sift through the wire mesh (*Photo 5*).

Make sure to get good coverage on the corners and edges of the blank, but don't build it up too thickly or the glass may crack when it cools. It is better to do two thin layers of enamel in separate firings than to go too thick at once. For the first layer, the depth of the enamel should be approximately the same as the thickness of the copper blank. If the color of the copper can be seen shining through the enamel, then the coating is too thin. Only do one color of enamel at a time, so excess enamel that ends up on your white paper can be put back into your container and reused.

Note of caution: *Eye and breathing protection should be used when working with powdered enamels.*



Dry-fit and then glue the enameled tiles on a black background, leaving a small space between them to allow for the natural expansion and contraction of the wood.

Firing with a torch

A stainless-steel wire rack is used to hold the blanks for firing. I tried using a rack I made out of hardware cloth, but the flame (you need 1450° F to properly melt and fuse the type of enamel I am using) caused the galvanized zinc on the wire to oxidize and swell up. Spend the money for a stainless-steel rack. The rack should be suspended above your work surface so you can apply heat to your tiles from underneath. Using a small spatula or your fingers, place the blanks onto the wire rack (*Photo 6*).

Let the blanks sit for a moment to let the water in the Klyr-Fire™ evaporate or carefully use the torch from the underside to apply a little heat. Once the blanks look dry, apply full heat from under the wire rack to one of the blanks (*Photo 7*). *See Using a torch sidebar.* The glass will change color and begin to melt. As soon as the whole blank surface is molten, move on to the next blank. Overheating can burn the enamel. Underheating will create a rough, orange peel surface. Let the blanks cool in place on the rack. While they are cooling, another batch of blanks can be prepared for firing. A spatula or pair of metal tweezers can be used to remove the blanks while they are still warm.

To get the best looking surface after the blanks have been fired, reapply the Klyr-Fire™ and another layer of enamel and then fire the blanks again. You will notice that the firing process has blackened the edges of each tile, providing a nice frame for the color. You may want to use a black marker or some black gesso in the recess of the bowl, so the wood will not show around the edges of the tiles.

Inlaying the tiles

When all the enameled tiles are finished, they should be dry-fitted in the bowl's recess all the way around the bowl (*Photo 8*). A large rubber band can be used to hold the tiles in place, as you are fitting them. This is where some of the narrower tiles may come in handy to completely fill the recess. A very small separation (.010" to .015") should be left between the tiles to allow for expansion and contraction of the bowl as it undergoes seasonal humidity changes. I learned how important this detail is some years ago. I had made a bowl with stone tiles glued into a recess. The bowl had been sitting in a gallery for some months, when

the gallery owner called to tell me the stone inserts were shattering and pieces were shooting across the room! The wood had contracted in the dry heat, putting huge stresses on the tiles. I had to take the bowl back and redo the inserts, leaving a little separation between them. You can't fight Mother Nature.

When you are happy with the tile placement, glue each one in place, again using the rubber band to hold them in position. A jewelry adhesive or thick CA (cyanoacrylate) glue works well. As you begin gluing the tiles around the bowl, mark the first tile so you will know when you have glued them all in place. Otherwise, it may be hard to tell the first tile you glued down as you work your way around the bowl. Use a sufficient amount of glue on the back of each tile to secure it, but try to minimize the glue squeeze out between tiles. Glue squeeze-out is unsightly and glue in the gaps between the tiles negates the benefits of keeping the tiles slightly separated. The completed bowl is shown in *Photo 9*.

Thoughts on design

I have described using rectangular tiles in the bowl's recess. This is the easiest shape to make and will work well if the recess is positioned so that the circumference of the upper edge of the recess is approximately the same as the circumference of the lower edge. A slight variation can be compensated for as you position the tiles. Parallelogram and other shapes of tiles will also work. Two shapes that will work and fill the recess are triangles and trapezoids with every other tile turned upside down. If you alternate the tiles in this fashion, an even number of tiles must be used.

The bowl shown in *Photo 10* has corrugated tiles. The corrugated copper blanks were made using a metal toothpaste tube squeezer. Strips of 36-gauge (.005" thick) copper sheet were corrugated by cranking them through the tube squeezer. The strips were then cut into individual blanks and enameled. This technique adds an additional design element to the enameled tiles.

Powdered enamel is available from a number of sources in a wide range of colors, both opaque and transparent. Transparent colors allow some of the luster of the underlying metal substrate to show through. I have made bowls with all the tiles the same color and also by alternating different color tiles. The color of the tiles can serve as a muted accent on the bowl or can make a bold statement. This is where your artistic vision and imagination are on display. ■

Using a torch

A commonly available MAPP gas torch (methylacetylene-propadiene propane) can be used to fire the enameled tiles by hand because it burns hotter than propane. You can buy a torch and MAPP gas canisters from most hardware or building products stores. The unit I use (*Photo a*) has a built-in igniter to light the torch (note the gray trigger). This is very convenient for one-handed ignition when you need to keep turning the torch on and off.

CAUTION: *Keep the canister upright during use and handle with extreme care. MAPP gas burns at 3670° F. As with any open flame, keep it away from combustibles and use in a well-ventilated area (preferably outside). Follow all instructions and safe use precautions that came with the torch you are using.*

a

A simple MAPP gas torch is sufficient for firing enameled tiles.

Wes Jones lives in Lawrenceville, Georgia, and has been a professional woodturning artist for seventeen years, specializing in large decorative pieces such as bowls, hollow forms, and vases. His work, which resides in private collections throughout the world, has been displayed at numerous venues and is available in a number of fine art galleries in Georgia. Wes teaches and demonstrates woodturning and has published a number of articles in American Woodturner *and* Woodturning Design. *He is active in three AAW chapters in Georgia and is a past president of the Georgia Association of Woodturners and of the Chattahoochee Woodturners.*


9

White Ash Bowl with Blue & Green Enameled Tiles, 2014, White ash, enameled tiles, 4" × 9" (10cm × 23cm)


10

Red Maple Bowl with Corrugated Orange Enameled Tiles, 2013, 5" × 8¼" (13cm × 21cm)