

Egg Shell Mosaic

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Materials and Supplies Needed:

- Wood, metal or plastic substrate or other rigid surface you wish to apply egg shell to
- Large pieces of clean egg shell
- Pigmented epoxy resin and hardener (Best: Colores brand with Grinding Hardener from Rio Grande Jewelers Supply (www.riogrande.com)).
- Vinegar and water
- Bowl for water (a large salad bowl will do)
- Solvent-based Contact cement (NOT the water-based type, and NOT Rubber Cement!)
- Disposable craft brush or disposable foam brush
- Tweezers
- X-Acto knife
- Wax paper or cellophane
- Hard acrylic brayer
- Very fine sandpaper – the type for wood (220 grit and finer) works well. Also, white, fine-grit manicure sanding sticks work for small areas. Micro sandpapers work are great for final sanding, but are more expensive. The important thing is that the sand papers not impart a color to the eggshell.
- Ronsol Lighter Fluid (type for cigarette lighters – sold in yellow container)
- Toothbrush with stiff bristles (can be used but must be clean)
- Disposable paper cups
- Popsicle sticks or other small stir sticks
- Clean 45-ply flannel buff (5" or 6" dia)
- Carnauba wax

The Substructure

Egg shell mosaic can be applied to any rigid surface that contact cement will adhere to. Flat surfaces are more successful than curved surfaces, but eased corners and slight curves are very possible. The surface should be smooth, clean and free of dust. Wood makes an excellent substrate but should be sealed first; the surface of a rigid metal structure also works well. Some hard plastics will also work. **See Page 3, "Things To Do Ahead of Time In Preparation for Eggshell Mosaic Technique"**

Applying the Egg Shell

1. Try to keep your egg shell pieces as large as possible. Gently rinse off the raw egg with running water, gently rubbing your finger along the inside of the shell.
2. Soak the egg shell pieces in dilute (5%) vinegar and water mixture for five or ten minutes to help loosen the egg membrane from inside. The membrane can be peeled or rubbed away gently with your fingertips. Do not soak the egg shell longer than 10 minutes as the vinegar will soften the shell.
3. After the membrane is removed, rinse well; allow shells to air dry or dry with hair dryer.
4. Do not attempt to cover too large an area of your object at one time -- a 2" X 2" area of your substructure is the largest you should cover in one glue application. Determine which area you will work first. Using a disposable brush, apply a thin coating of contact cement to the selected area of the substructure and to the inside of a few large egg shell pieces.
5. Allow the contact cement to become dry to the touch (about 5 minutes). One by one, place the large pieces of egg shell on the surface of the substructure and press down with your fingertips. How close together you place the shells is up to you, but try not to leave large gaps between sections of egg shell.

As you press down firmly with your fingertips, the egg shell will crack and adhere. Gaps can be filled in with small pieces of egg shell applied with tweezers.

6. Apply cement to the next area and to more egg shell pieces and repeat step 5 until the entire object has been covered.
7. With as much pressure as possible, roll a hard plastic brayer over the egg shell surface. This will help adhere the shell and enhance the cracking. Use an agate burnisher in areas the brayer will not work.
8. If any contact cement oozes out onto the surface of the egg shell, carefully remove it with lighter fluid or contact cement solvent. (Use a dampened cloth and avoid saturating the surface with solvent as it will weaken the bond.)
9. Allow the cement to dry thoroughly (preferably overnight).
10. To make sure there are no loose pieces of egg shell, brush the surface vigorously with a stiff bristle brush. Pieces of shell will sometimes loosen around edges and tight curves. If this occurs, allow them to flake off. If you do not like the look of the voided area, do the following: Using a needle or other pointed instrument, try to gouge out the dried contact cement from the void area. Carefully apply fresh contact cement with a small brush. With tweezers, place pieces of egg shell (broken to the correct size and coated with fresh contact cement) into the void. Roll with brayer and allow to dry again.

Applying the Pigmented Filler

11. Properly mix the two-part pigmented epoxy (see information below). Using a popsicle stick or flat toothpick, spread the epoxy over the entire surface of the shell-covered object, forcing it into the cracks and gaps. Use a clean popsicle stick as a scraper to remove excess epoxy.

Allow epoxy to cure thoroughly (preferably overnight) on a flat, level surface. It should be very hard when cured – it should not be tacky, and you should not be able to leave an impression in it with your fingernail.

12. After the epoxy has cured, gently sand the epoxy/eggshell surface with fine white or light colored sand paper. Start with 220 grit and work down to the finest sand paper available. The objective is to remove all excess epoxy and to hone the shell pieces and epoxy to a smooth, uniform surface. Do not attempt to sand if the epoxy is not completely hard and cured.
13. After the surface has been sanded with the finest paper, wipe clean and buff to a sheen. The best finish is achieved by charging a soft and clean muslin buffing wheel with pure carnauba wax and buffing on a high-speed buffing machine. Alternatives to buffing include spraying the surface with a non-yellowing spray finish such as Krylon Crystal Clear® or waxing with a micro-crystalline paste wax such as Renaissance Wax®.

The Epoxy

Epoxies come from a family of thermosetting resins available in a wide range of characteristics. The most common epoxies come in two parts – Part A: a resin, and Part B: a catalyst (or hardener). For the egg shell mosaic process, a low-viscosity (thin) epoxy works best. A good choice is an epoxy resin system called Colores®, available from Rio Grande Jewelers' Supply. The Colores® system includes different choices of hardeners: thick, thin and "Grinding Hardener" – you want to use the Grinding Hardener, pigmented resins in a wide range of colors (both opaque and transparent), and plastic applicator bottles. If you are impatient, you can use the pigmented resins from the Colores® system with a hardware store variety 5-minute epoxy hardener. Alternatively, you can use 5-minute (or longer setting epoxies) with artists' powdered pigments.

DO NOT TRY TO SPEED UP CURING WITH HEAT OF ANY KIND, as this will buckle the egg shells!

Things To Do Ahead of Time In Preparation for Eggshell Mosaic Technique

Items You Will Need

- **18 gauge Copper or Brass Sheet (3" X 5")**
Important: Metal should be perfectly flat, free of dents, deep scratches and gouges. Do not anneal the metal.
- **Double-sided carpet tape** (wide rolls available at hardware stores)
- **A very flat, smooth and rigid board** or thick acrylic sheet cut a little larger than the 3" X 5" sheet metal
- **Coarse Sandblasting Medium** (I use coarse sharp sand --the kind you can get at a hardware store. I sieve it to make sure it doesn't have large granules or small pebbles. Any coarse cutting medium will work as long as it creates a good, sharp tooth on the metal.)
- **A quart-sized zip-lock baggie**
- **White Egg Shells** (Save the shells from about 4 uncooked chicken eggs)

Sandblasting The Metal

To make sure the metal sheet does not bend or warp, do the following:

Using double-stick carpet tape, temporarily stick the sheet metal to a flat board or other flat, rigid backing. This gives you something easier to hold onto inside the blasting cabinet and helps keep the sheet flat during the process of blasting.

Hold the sandblasting nozzle at a very shallow angle to the sheet metal (i.e., not perpendicular to it). Blast from a distance no closer than 6", and use back and forth sweeping motions for an even, all-over texture. You should not have to exceed 40lbs of pressure on your air line.

You will be applying the egg shell to the sandblasted side of the metal, but you can blast both sides of the metal if you wish.

After sandblasting, wash off the sandblasting dust, dry the metal and store it in a zip-lock baggie. The idea is to keep it free of tarnish, etc. so you don't have to clean it again before applying the egg shells.

Preparing the Egg Shells

It's Important that the eggshell pieces are large. When you crack the uncooked egg, try to break it in two or three large pieces instead of a bunch of little pieces. The bigger the shell, the better.

Gently rinse the shells under running tap water until the raw egg is rinsed away. Allow the shells to dry and then store them so they won't get crushed.