

Keum-boo on PMC
Handout for presentation on Keum-boo
at the 2nd International PMC conference July 23, 2004
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Keum-boo: Keum-boo (also spelled Kum-boo), meaning literally “attached gold”, is a simple, reliable process through which 24k gold foil is bonded to the surface of another metal, usually fine silver. All types of Precious Metal Clay accept Keum-Boo. The beauty of using Keum-Boo with PMC is that silver metal clay, unlike conventional fine silver sheet, needs no preparation. It’s never cleaner than when it comes out of the kiln.

The Metallurgy: Gold attaches to the fine silver through a diffusion bond, an atom exchange at the interface of the two metals. Fine silver and fine gold produce no oxides, as long as there are no oxides, no air or impurities between the metals to act as a barrier, the gold and silver molecules will co-mingle, or link up at the interface, and create a durable, permanent bond. Heat, pressure (through burnishing), and the cleanliness of the metal all contribute to the success of the process.

Start Small and Flat: Until you’ve become accustomed to the Keum-Boo technique it’s best to make your pieces small and flat, or very gently curved.

Considering Texture: Low relief textures, or more specifically, textures with walls that are at an angle rather than perpendicular to the surface, are much easier to apply Keum-Boo gold to than deep textures with vertical walls.

Coil Cover: A coil cover, in addition to evening out temperature fluctuations, will prevent pieces of gold from falling through the coils of your hot plate. It can be as simple as a 6x6" sheet of brass (20 or 22 gauge), copper or steel, or, if you have a few basic tools and the skills to use them, a more useful cover can be fashioned by pounding out a few depressions in the metal. Two or three round concavities will greatly expand the usefulness of the coil cover.

Types of Gold Foil: Gold leaf - Not Recommended, too thin unless tripled and this is hard to do.

Enameling foil - Not recommended, too thin unless doubled, at least.

Allcraft KB24 - Preferred: This foil is thinner than you can roll yourself, so more economical, and it follows the topography of textured metal well.

Art Clay - This foil is a bit thicker than KB24 but unless you're certified in Art Clay its expensive.

Home made- Rolling your own foil produces a thicker foil; its time consuming, but excellent for some applications.

Punching/ Cutting the Foil: Allcraft and thinner can be cut with any good pair of scissors, paper punches, leather tools, craft knife, etc. Hand-rolled thicker foils can often be cut with paper punches and craft knives but not with all scissors. Light duty metal shears (like Joyce Chen) are a better choice for thicker foils, like hand rolled.

TIP: The thinner foils all benefit from being placed between sheets of paper to cut or punch out shapes.

The Technique: **Tip:** Use leather garden gloves that really fit.

SAFETY TIP: Although PMC hollow-form pieces do not require a hole for gasses to escape during firing, they do need a hole for heating during the Keum-Boo process.

Placement: Place the freshly fired PMC on the coil cover on the hot plate. Use tweezers (clean, no flux residue) or your fingers, to place the gold.

Temperature: Turn the hotplate to high. A chopstick will char when pressed against the heated surface at approx. 550F. That's the tip that it's close to time to tack the gold. A bond occurs at temperatures between 650° and 850°F. I work in the 700° to 800°F range.

Tack & Burnish: Wearing leather gloves, use a burnisher or a cross-lock tweezers to hold the piece steady and the tip of another burnisher to tack the middle of a gold shape down. Don't rub; just press to do the initial tack. Then burnish, using medium pressure, circular movement, and the belly of the tool. Work from the center outward so you don't trap air. Do not quench the piece, air cool

Checking Adhesion: When you have finished burnishing foil onto the design, hold the cooled piece up to good light and examine the surface and especially the borders of the attached gold. Run your fingernail along the edges of the gold, and try to lift them. Well-attached foil does not make an abrupt transition at its borders.

Finishing: You can now go on to solder, patina, etch, hammer or form your piece in other ways. If, upon heating, the attached gold develops little bubbles it indicates trapped air, generally due to poor adhesion. After the piece has cooled you can sometimes re-burnish with your fingernail. A large bubble can be poked with a pin, heated and re-burnished.

Traditionally, all fabrication work (soldering, etc.) was done prior to applying Keum-Boo. However, I routinely solder posts on earrings (with medium solder) after finishing the Keum-Boo. If you do have occasion to solder before you Keum-Boo, you must pickle, boil with baking soda, and clean with denatured alcohol, prior to applying the gold.

Removing the Burnishing Marks: When you are finished putting the foil on, remove the burnishing marks in any of the following ways. Rub the piece with a little dampened pumice on your finger for a soft satin finish. Pumice on a soapy brass brush will give a higher shine but less contrast between the gold and silver. Substitute baking soda for pumice and you get a slightly softer look. The finer the abrasive the less contrast you'll get between the two metals. You can tumble your piece and that work hardens it as well. Do not use a satin finish wheel or other harsh abrasive material, as it will very quickly abrade the thin layer of gold. If you are going on to patina the piece, brass brushing is the best preparation.

This handout contains excerpts from, "Keum-Boo on Silver" by Celie Fago

Fago Studio

1037 Christian Hill Rd.

Bethel, VT. 05032

celie@adelphia.net

www.celiefago.com