

## Cyprus™ Copper Metal Clay Instructions

Developed by Cindy Silas, Cyprus Copper Clay is an excellent base metal clay medium for jewelry, crafts, sculpture and models. Offered in lump (wet) form, this clay is water-based, air dries and fires to .999 pure copper. Economical, easy to form, fire and finish, the fired clay presents as beautiful on its own or as the perfect platform for enameling projects.



### Greenware and Dry Construction

In its greenware state, the clay is slightly flexible and carves easily. Air drying the unfired clay or greenware without heat will reduce the potential for warping as the clay dries. Once completely dry, the greenware should be handled with care as it can be fragile. It is much easier to sand and refine the greenware at this stage than to refine the metal once sintered. When joining pieces, create a paste slurry at the join with water, then compress both pieces together for 30 seconds. Put aside to dry completely. Metal clay must be completely dry before firing.

### Embedding Objects

Cubic zirconia, lab created gemstones, bezel cups and other findings or embeddables can be co-fired with Cyprus Copper Clay. Please refer to our Gemstone Firing Guide for a comprehensive list of gemstones that are compatible with the firing times and temperatures of Cyprus Copper Clay. Most, but not all, CZ's and lab created gemstones can be fired at 1600°F / 871°C for 3 hours. We do not recommend firing Nano gems with Cyprus Copper Clay as they may not retain their color or brilliance.

### Firing

Cyprus Copper Clay is best fired in a kiln in two phases. The first phase completely burns out the binder, which helps the work sinter properly in the second phase. Many kilns fire hotter or cooler than their digital read-outs state. It is a good idea to test your kiln for temperature accuracy. This can be done with a hand-held digital pyrometer.

**Phase 1** | Full ramp to 650°F / 343°C and hold for 30 minutes.

**Option 1** - Arrange greenware on a mesh firing rack. Additional pieces can be stacked using more mesh firing racks separated with kiln posts. Raise the mesh firing rack(s) off the kiln floor with a few more kiln posts for air circulation.

**Option 2** - The greenware can be placed on top of 1" of activated carbon in a steel firing container. Do not add activated carbon on top of the greenware for the phase 1 firing.

**Note:** A slower phase 1 is needed for any piece that has areas that are 3mm (12 cards) thick or thicker. Ramp 300°F / 149°C hour to 600°F / 315°C and hold for 15 minutes.

**Phase 2** | Full ramp to 1600°F / 871°C and hold for 3 hours.

Once the greenware has cooled enough to handle (phase 1), gently transfer the work to a kiln vessel, such as a steel firing container that has at least 1" of activated carbon spread on the bottom. Arrange the pieces with at least 1/2" of space between them. Cover all pieces with at least 1" of activated carbon. Additional work can be added in layers as long as there is 1" of activated carbon above and below each piece. Fire with a slotted lid or lid ajar. Do not cover firing tin completely.

### Firing Media

Coconut Carbon is recommended. Coal Carbon will also produce successful results. Magic Carbon is not recommended for use with Cyprus Copper Clay as it may complicate the use of embeddables, bezel settings and repairs, causing an increased or uneven shrink rate. It may also increase the shrink rate of the clay. We recommend creating a small test piece and fire per the schedule before committing complex work to firing.

### Shrinkage

During firing, this clay shrinks 20% as a result of the organic binders burning off (phase 1) and also the sintering process (phase 2).



## COOL TOOLS

### Enameling

After the Cyprus Copper Clay has been fired, remove all traces of carbon and clean any grease or fingerprints off with surfactant and a Scotch-Brite™. Rinse thoroughly, making sure the piece sheets under water. Before enameling one side, paint Scalex onto the opposite side and allow to dry. Once the Scalex has dried, flip the piece over and spritz a 50/50 of Klyr-Fire and water solution onto the copper. Sift enamel and allow to dry completely before firing.

**Important!** When applying the first coat of enamel to Cyprus Copper Clay, it is essential to fire the first layer long enough to allow the enamel to fuse, not just fusing to itself, but also to the metal. Use medium or hard fusing enamels on the first coat and continue to fire it after you see the enamel even out and fuse. Pieces should be in the kiln for three to four minutes for the first layer of enamel and counter enamel. During the firing, the copper will naturally produce red oxide in the early stages that will be plainly seen when firing with clear enamel. The red oxide will dissipate through the clear enamel and the copper will return to its bright color when the enamel is fully fused to the copper.



*Example of under fired  
undercoat of hard fusing clear  
(red oxide not dissipating).*



*Example of a fully  
fused and properly  
fired hard fusing clear.*

Once the undercoats are on, succeeding firings of enamel can be removed from the kiln right after the enamel fuses. Allow your enamels to air cool. Never quench your enamels.

### Finishing & Polishing

Once firing is complete, it is best, but not necessary to let the work cool completely. Place a mesh firing rack over an empty steel container. Pour the contents of the fired container through the firing rack into the empty steel container to retrieve the sintered copper. The metal can then be polished using a wire brush, rotary tools, tumbler, or other polishing tools.

### Patination

To achieve a dark result from Liver of Sulfur (LOS) or Cool Tools Patina Gel, ensure that the work piece is absolutely clean by soaking and then brushing with hot water, soap, and ammonia. Using a strong solution of LOS in very hot distilled water, dip or soak in the solution until the desired darkness is achieved. Adding a teaspoon of ammonia to the LOS bath can also help achieve a darker result or, possibly, a rainbow effect. A bath of baking soda and water will neutralize the LOS bath and halt the patination process. Then, either by hand or by machine, bring up the high points with a polishing cloth, Scotch-Brite pad (satin finish), or polishing wheels (high shine). If desired, protect the patina with a coat of Everbrite™ Protecta Clear® or Permalac ClearCoat Spray.

### Soldering

Once fired, this copper clay is metallurgically just like other copper metals, but, like other fired metal clays, it is more porous than sheet stock or cast items. Due to this porosity, this copper clay will “soak up” solder. When possible, prepare areas for solder by burnishing to close the open pores and reduce the tendency to absorb solder. Join other metals and findings to fired copper clay by using the same flux, solder and torch(es) as you would to solder other copper products.

### Storing

Unused clay can be placed in plastic wrap and stored in a Cool Tools Clay Hydrator to keep it moist.

### Rehydrating

Unfired clay can be rehydrated. Large dried pieces can be put into a heavy plastic bag and hit with a mallet to break up the pieces. A dedicated coffee bean grinder can then pulverize the smaller pieces back into a fine powder. It is recommended to wear a dust mask when working with any kind of powder. Pour the desired amount of powder into a small bowl. Add 7 ml distilled water for every 50 grams of powder, then stir. Transfer the clay to a lightly oiled plastic sheet such as a sheet protector. Fold the sheet over, then flatten the clay with a roller. Do not overwet the clay, but do add another spritz of distilled water if needed. If you do over wet the clay, put it aside until some of the water has evaporated. Continue re-folding the sheet and rolling, until the clay is lumping together and no longer sticking to the plastic sheet. Either lightly oil your hands or use vinyl gloves to further knead the clay into a well-mixed lump. Now it's ready to use!