

Instructions for Using Clay-Bond Plus™

These instructions were issued on 1/5/2013. They supersede all earlier versions.

Clay-Bond Plus™ is a new and improved formulation of **Clay-Bond™**, which is a silver-containing solder used to join bronze, copper, and brass articles. **Clay-Bond Plus™** can be used to join sterling silver and fine silver to fired silver clay articles, as well as to join articles made from BRONZclay™, COPPRclay™, Argentium™, brass, and any combination of these metals to each other. It is a powder that is mixed into a paste with water and then applied to the surfaces to be joined. After firing it forms a strong metallic joint suitable for all jewelry-related applications.

Advantages of **Clay-Bond Plus™** over conventional solder pastes include:

- Firing is done in a kiln, so a torch and open flame are not required.
- It contains a binder that dries and holds the two pieces together before and during firing, so precise alignment of the pieces is easier than with solder paste.
- It will not spread beyond the join and wet surrounding metal if fired properly.
- When used to join sterling silver, it is impossible for fire scale to form on the sterling.

Steps for using Clay-Bond Plus™ to Join Jewelry Articles to Findings

Whether joining silver, bronze, or copper clay articles, they must first be fired according to the manufacturer's instructions. Findings, such as earring posts and bales, can then be easily joined to any of these metals.

- 1) To achieve a strong bond it is essential that the two surfaces to be joined are flat and mate well. Prepare the jewelry article by filing a flat surface where the join is to be made. Clean the surface of the finding at the region of the join. Abrading lightly with a stainless steel brush on a Fordham- or Dremel-type tool works well.
- 2) Hold the two pieces together and observe the mating surfaces; there should be no light passing between them.
- 3) Mix a small amount of **Clay-Bond Plus™** with distilled water on a glass, plastic or porcelain surface with a brush that has short stiff bristles. Save the unused paste – it can be remixed with water and used again.
- 4) Apply one coat of paste to each surface. Remember, **Clay-Bond Plus™** is a paste, not paint, and so sufficient thicknesses must be applied to confer enough solder material to create a strong bond. This first coat should be thick enough to be opaque - not real thin, but not globbed on either. If globbed on, the finding will not sit squarely on the join region but will be tilted.
- 5) Place the two pieces on a preheated coffee warmer for at least 15 minutes with the pasted surfaces not contacting the warmer. If using a large jewelry article, such as a bracelet, dry for a longer time. Over-drying is not a problem.

This next step applies to joining findings to silver clay only. Because fired silver clay contains porosity that wicks solder into the clay, it is necessary to fire an initial coating of solder at the join region so that the second coating will not be absorbed, but will remain on the surface to bond to the finding. When joining fired bronze and copper clay articles, the pre-coating Steps 6-9 may be omitted.

- 6) Place only the paste-coated fired silver clay article in a firing container that has about one-quarter inch of activated carbon on the bottom. Leave the finding on the coffee warmer. Cover the article with a small piece of aluminum foil (to protect the solder paste), then cover the article with about one-half inch of activated carbon. Place the lid on the container.
- 7) Place the firing container on kiln posts in a kiln preheated to 660 F (350 C) and heat for 15 minutes. If the silver clay article is large, like a bracelet, the heating time should be adjusted by trial and error to be longer.
- 8) Remove the firing container with tongs and allow it to cool for at least 20 minutes, and then remove the article.
- 9) Brush the solder-coated surface lightly with a stainless steel or brass brush to create a clean solder surface.
- 10) Apply a second coat of **Clay-Bond Plus™** paste to the article, a bit thicker than the first layer and to the finding. Immediately press the two pieces together firmly - but do not squeeze all the paste from the join region.
- 11) Carefully place the joined pieces on the coffee warmer and dry for at least 15 minutes.
- 12) Remove all visible slip from around the edges of the join with a tool such as a toothpick or needle. This step is necessary to prevent **Clay-Bond Plus™** from showing around the edges of the join after firing.
- 13) Carefully (to avoid inadvertently separating the pieces) lift with tweezers the jewelry article and place the cemented pieces in the firing container with about one-quarter inch of activated carbon on the bottom. Cover the pieces with

about one-half inch of activated carbon, and then close the container. Fire the cemented articles at 660 F (350 C) for 15 minutes. Begin timing when the kiln temperature has reached about 580 F (325 C). (Important: see paragraph below on Effect of Kiln Type.)

- 14) Remove the firing container from the kiln and allow it to cool.
- 15) Remove the articles and then apply whatever final finish is desired.

Steps for using Clay-Bond Plus™ to Join Exposed Joints Such as in Jump Rings

Clay-Bond Plus™ is a paste that is designed not to flow, and so it will not fill in gaps between the ends of a jump ring. Therefore the ends must line up exactly and be touching.

- 1) Clean the join region with a stainless steel brush.
- 2) Apply a very small amount of paste at the join region. Spread it smoothly and uniformly.
- 3) Dry on a pre-heated coffee warmer for 15 minutes. A small piece of aluminum foil on the warmer will prevent the pasted region of the jump ring from sticking to the warmer.
- 4) Remove the jump ring and carefully apply a second, very small coat if deemed advisable. Applying a second coat is a judgment call by the user and may not be necessary.
- 5) Heat in a firing container filled with activated carbon as described above at 660 F (350 C) for at least 15 minutes, then remove from the kiln and cool the container.

Useful Information and Tips

Learning to use this product: It is highly recommended that the user acquire familiarity with this product by initially practicing with scrap pieces of jewelry or other metal to develop a suitable technique.

Troubleshooting: This product will provide joint strength sufficient for all jewelry applications after proper application and firing. The strength is comparable to that obtained from conventional silver solders. The most likely problem would be a weak joint after firing. This can result from three obvious causes: 1) insufficient solder paste between the surfaces prior to firing (repeat Steps 10-15); 2) the kiln is firing at too low a temperature (re-prepare the surfaces and then try heating at a setting 50 F higher than 660 F, i.e., 710F); and 3) insufficient solder paste was applied in Step 5 to the silver clay article (repeat Steps 4-9).

Pre-fired joint strength: There is some water soluble binder in **Clay-Bond Plus™**, unlike in conventional solder pastes. This binder allows two pieces to be cemented together before firing, but this pre-fired joint is not strong. Therefore, the cemented pieces should be handled carefully before firing so they do not come apart. If they come apart, they should be re-cemented with wet paste and dried as described above before they are fired.

Effect of kiln type: Different kiln styles will cause **Clay-Bond Plus™** to fire differently. The firing temperature and time in Steps 7 and 13 will work fine for some kiln styles but may not for others. In particular, kilns with the heating elements completely enclosed in the walls may require extending the firing time and/or temperature. Also, large pieces of jewelry will require longer firing times to reach the desired temperature inside the firing container.

Firing container: A 5 inch diameter x 7/8 in. deep plain steel container is available from distributors of **Clay-Bond Plus™**. A 5.5x3x2.25 inch stainless steel pan used to fire BRONZclay™ and COPPRclay™ may also be used. Be sure to use kiln posts to ensure even heating of the container. Do not fill the stainless pan with activated carbon deeper than stated in Step 13 or the heating rate may be too slow.

Torch firing: **Clay-Bond Plus™** can be torch fired. Heat the cemented and dried pieces quickly in air until the solder flows. Do not overheat to minimize oxidation of the jewelry articles.

Safety Precautions

Clay-Bond Plus™ contains fine silver powder and a chemical fluxing agent that can irritate the eyes. Take precautions to avoid getting it into the eyes. Wash your hands after use, and do not touch your eyes while handling **Clay-Bond Plus™**. If it does get into the eyes, flush them thoroughly with water for at least 15 minutes and contact a physician for further treatment. Although **Clay-Bond Plus™** is not highly toxic, avoid ingesting it. If ingested contact a physician immediately. Work safely!

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