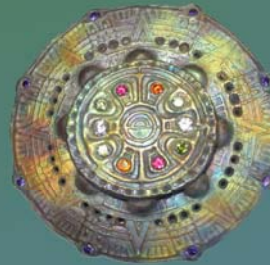




The Basics of

BRONZclay™

FASTfire BRONZclay™



BRONZclay™ Inca Sun by Stan Micallef

Tips, techniques, and tools
for working with
BRONZclay™ & FASTfire
BRONZclay™.



BRONZclay™ octopus sculpture
by Gordon Uyehara



Brought to you by

Art Clay World USA

Welcome to BRONZclay™!

BRONZclay™ & FASTfire BRONZclay™ are malleable substances made from metal particles, organic binder, and moisture, and can be used to create any embellishment or adornment you desire. Sculpt, texture, or mold them into exactly what you wish it to become, and enjoy the limitless possibilities of this unique medium.

Bronze Beginnings

Bronze is one of the first-developed and longest-used metal alloys in human history. The main ingredient for bronze is copper, and through time the remainder of the alloy is filled with tin, aluminum, phosphorus, silicon, or manganese. The first bronze was actually made from combining copper and arsenic, but today the majority of bronze is made with copper and tin.

As cultures and countries developed, copper, tin, and the resulting bronze were often used as trade items, so much so that new villages were often settled along copper and tin mining sites. Conveniently, tin and copper deposits are nearly always located close to each other.

Over the centuries, bronze has been used in nearly all aspects of human industrial development and function. Bronze has been used for weaponry, armor, cooking pots and utensils, adornments, sculpture, structure and dwelling reinforcement, handheld tools such as hammers or mallets, ammunition such as cannonballs, musical instruments, and even coin currency.

The first examples of people working with bronze come from Egypt, China, and Greece around 4500 B.C.E. From the 14th century B.C.E., evidence of extremely skilled and detailed bronzework has been found. Early Chinese art from 14-15th centuries B.C.E. are credited to be the first examples of lost-wax casting. Around the same time, the Romans and Etruscans were working with bronze for adornment items, tools, and handheld weapons. Once used for basic items such as cookware, bronze took on a new role in the world of religious items. In Nigeria, the Benin culture was hailed for exquisite religious ritual items, while in the Philippines bronze cannons shattered the silence and introduced the world to bronze heavy artillery. From these early beginnings developed bronze sculpture and patinas, leading us hundreds of years later to the 1430's casting of artwork by Donatello. By the 1700's, artists were painting gilt onto bronze pieces to further increase their value and detail.

Today, bronze is still used for countless items, from weatherstripping to conduit. Now, with the invent of a bronze clay, our only limit is our imagination (and maybe the size of your firing pan!)



BRONZclay™ knife by Emma Baird

Suggested Tools for Working with BRONZclay™

Like other clays, BRONZclay™ & FASTfire BRONZclay™ can be formed, molded, sculpted, and shaped using your own hands, and just about anything else you can find lying around.

Standard Tools

Necessary for any project, these are the basic items:

- Portable, hard working surface
- Thin non-stick surface
- Rolling tool
- Spacers (slats or playing cards)
- Small paintbrushes
- Cocktail straws
- Measuring tool (ruler, tape)
- Craft knife
- Small file set
- toothpicks
- Burnishing tools
- Tweezers
- Rubber block



Graduated slat set for controlling clay thickness (ACW product # F-125)



Agate burnisher for shining surfaces. (ACW product # R-036)

Specialty Tools

These tools may be beyond the basics, but they are still easy to find and great to have available:

- Specialty-tipped shaping tools
- Clay sculpting tools
- Rubber stamps
- Silicone texture sheets
- Tissue blade or ceramic scraper
- Magnification lenses
- Specialty shape cutters (like fondant or small cookie cutters)
- Patinas
- Specifically-shaped brushes
- Gemstone-setting tools/burs
- Mandrels (ring, bracelet)
- Hand drill/pin vise
- Engraving tools
- Extruders
- Embossers
- Tumbler



Exclusive flexiMold™ silicone molds, (ACW product # beginning with FLX)



Liver of Sulfur patina can add color and contrast to your pieces. They are available in dry (2 sizes!) and gel options. (ACW products # F-037, F-038, and F-035.)

Helpful Hints

BRONZclay™ is a typical clay in that it begins to dry as soon as the packaging is opened. Here are some tips to help you keep your clay workable as long as possible:

- When not in use, keep the clay tightly wrapped in plastic and place the wrapped piece in a sealed plastic bag for added protection. Some teachers recommend storing unopened packages (as well as opened packages) of BRONZclay™ in a refrigerator when not in use.
- If you notice a black tinge to your clay, scrape it off until the clay seems moist and clear again, then keep working. Be sure to keep the clay air-tight between future uses.
- Rub a dab of olive oil on your hands before you begin working with the clay.
- While working the clay, refresh it periodically with a small amount of water using a spray bottle or brush.
- Sculpt pieces of clay together well with moist clay; thin slip does not work as well.
- Wrap pieces that you are not currently working on in plastic and place it to the side.
- Avoid using tools that absorb water (i.e. wood or other porous materials).

Embellishing BRONZclay™

Because of the firing requirements for BRONZclay™, it is not a good fit for firing natural gemstones in place. Some Cubic Zirconia may work well; speak with your supplier of CZs for their general firing capabilities. However, if you desire to set natural gemstones, you will need to get creative with pre-formed settings or wire.

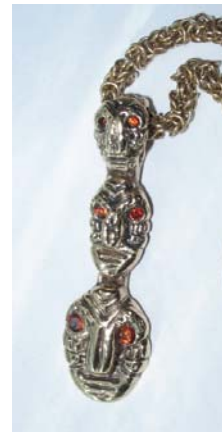
BRONZclay™ is a great candidate for any embellishment added after firing, including resins, beadwork, and enamels.



BRONZclay™ and turquoise pendant created by Julie Campbell



BRONZclay™ and pearl bracelet created by Emma Baird



BRONZclay™ tribal pendant by Stanley Micallef

Layers and Attachments



BRONZclay™ Wood Spirit pendant
created by Barbara Diane Hance

Unlike silver or gold clay, BRONZclay™ does not yet have a slip, paste, or syringe-type formula. You can create your own slip or paste by adding water to BRONZclay™, however, this does not always lend itself for a strong attachment.

The best way to attach layers is to sculpt them together, adding each layer while the one below it is still moist enough to sculpt into. There are rubber-tipped sculpting tools on the market that are wonderful for this type of clay work.

To create layers, dangles, bangles, and dimensional effects, consider little bronze or wire rivets to hold things in place. Get creative with bails, wire, and jump rings to make interesting and unique attachments. While slip may not be the most reliable route for strong attachment, there are plenty of other options for fantastic findings.



BRONZclay™ pendant
created by Donna Lewis

Drying BRONZclay™

Once you've finished your piece, you will need to dry the clay before firing it. Like any other metal clay, the moisture needs to be completely removed to avoid generating steam within the piece, which would push outward and cause pocking and damage to the piece during firing.

Gently place the piece on a warming surface such as a coffee mug warmer (ACW #F-247) or the top of a kiln (be careful to keep pieces away from the kiln's vents). A food dehydrator (ACS #DH-05) works well, too. Once BRONZclay™ is fired, it's much more difficult to finish, so the more pre-finishing work you can do, the better. The dried "green" stage is the best time for smoothing, filing, sanding, drilling, carving, and engraving.

BRONZclay™ shrinks a total of about 20% from package to finished product—keep this in mind as you create your pieces.



A candle or mug warmer
makes the perfect
drying tool.
(ACW #F-247)

Firing BRONZclay™

To reduce oxidation, BRONZclay™ pieces must be surrounded by activated carbon (ACW #BZ-004 or BZ-005) during firing. Firing BRONZclay™ is a multi-step process that uses low heat to vaporize the binder, then high heat to sinter the metal.

To Fire BRONZclay™ in your electric, digitally programmable kiln:

Part A: Open Shelf Firing

i. Place pieces, spaced well, on fiber board or fiber blanket. Ramp the kiln 482°F per hour up to 720°F and hold for 60 minutes. Pieces can be moved or transferred as soon as you care to handle them with stainless steel tweezers/tongs. (Note that this is when the pieces are most fragile. Consider waiting until cool enough to move work with your fingers, as your fingers are generally more gentle than metal tools.)

Part B: Oxygen-Restricted Firing

i. Pack pieces into activated coconut carbon. Spread 1" of activated coconut carbon granules on the bottom of a stainless steel firing container (ACW #BZ-003). Place the piece on top of the layer; if firing two or more pieces, leave at least ½" between pieces, more if the pieces are large. Do not try to put more work in the pan than space really allows, as this will only risk the proper firing of the pieces.

Pour more activated carbon granules on top of the pieces until the container is full, making sure there is a ½" layer of granules on top of the pieces. Again, if you are firing many pieces in layers, make sure there is at least ½" of space between the vertical layers as well. Put the stainless steel lid on the firing container and place it in the kiln on stilts/kiln posts to allow for heat circulation. **NOTE:** Front-loading kilns are cooler in the front near the door, so the front of your firing container will be cooler than the other sides. Compensate for this by placing the pieces closer to the sides and back of the firing container, making sure you leave at least 1" of space between the pieces and the front of the firing pan. If you have a top-loading kiln there's no need to adjust. If you are using a smaller kiln and don't have enough space for true kiln posts, at least get the pan off the kiln floor with trimmed fiber board.

ii. Ramp 662°F per hour to 685°F and hold for 90 minutes.

iii. Without stalling or cooling, ramp up 1022°F per hour to 1544°F, and hold for 165 minutes.

iv. Allow the firing pan and pieces to cool before handling. Finish as desired.



Making it easy: The BRONZclay™ Combo Kit from Art Clay World, USA (BZC-01) Included: 100g COPPERclay™, firing pan, and 2lbs carbon.

Firing New FASTfire BRONZclay™

FASTfire BRONZclay™ fires pieces in one step! No open shelf firing needed. To reduce oxidation, piece(s) must be surrounded by coconut shell-based activated carbon during firing (ACW #BZ-004 or BZ-005).

To Fire FASTfire BRONZclay™ in your electric, digitally programmable kiln:

i. Spread 1" of activated carbon granules on the bottom of stainless steel firing container (ACW #BZ-003).

ii. Place the piece on top of the layer; if firing 2 or more, leave 1/2" between pieces, more if pieces are large.

iii. Pour more activated carbon granules on top of the pieces until the container is full, making sure there is a 1/2" layer of granules on top of the pieces until the container is full, making sure there is at least 1/2" of space between the vertical layers as well.

iv. Cover with slotted stainless steel lid (or offset your solid lid to create a gap) and set it in the kiln on stilts to allow good heat circulation.

v. Ramp kiln at 1525°F/830°C per hour to 1525°F/830°C, and hold for 1 hour.

Note: Firing will leave a residue on the piece(s) which must be removed before finishing. This residue is easily removed by brushing the piece under running water. Only fire with coconut carbon as firing with coal based carbon will result in discoloration.

Tip: When firing FASTfire BRONZclay for the first time, we recommend making and firing a test piece. The test piece should be at least 1.5" x 0.5" and at least 3mm thick. This piece should be fired using the guidelines listed above. If the test piece shows small blisters, reduce both the ramp and hold temperatures to 1475°F/807°C. If the surface of the fired piece is smooth, attempt to bend the test piece to a 90° angle, and look at the outside of the bend. If the piece has a large crack or breaks, increase both the ramp and hold temperatures to 1575°F/862°C. If the outside of the bend has little cracks or no cracks, continue bending the piece into a U (180° angle). If the piece shows large cracks or it breaks, increase both the ramp and hold temperatures to 1550°F/843°C. If the surface is smooth and after bending the piece into a "U" no cracks appear, then no adjustment is needed.



BRONZclay™ must be fired submerged in activated coconut carbon inside a firing pan.

Finishing BRONZclay™

Once fired, the piece is a solid piece of metal. As with other fired metals, it can be sawn, drilled, sanded, patinated, or soldered using traditional jewelry tools and materials. Keep in mind that many finishing techniques will be easier to perform at the dried, pre-fired stage.



BRONZclay™ and silver
Beginnings Bracelet
created by Linda Stiles Smith

Straight from the kiln, BRONZclay™ can be a wide range of colors, from greens to vibrant reds to more traditional brassy colors. You may choose to leave the colorful metal alone, or you can use tools to make the piece shinier and more traditionally colored. To bring out a true bronze color and finish, use a stainless steel brush or metal burnisher. For a very shiny finish, tumble the piece for at least two hours with stainless steel shot.



BRONZclay™ textured bracelet
created by Barbara Diane Hance



BRONZclay™ leaf
created by Sherry Viktora

Photo by Steve Augle

Safety and Precautions

The binder in BRONZclay™ & FASTfire BRONZclay™ is non-toxic, and no toxic fumes will be present during firing. Though rare, it is possible for some individuals to experience some skin sensitivity to BRONZclay™. We recommend wearing a dust mask while working on greenware and with the activated carbon. Please see the MSDS for BRONZclay™ & FASTfire BRONZclay™ for more specific information (available at www.artclayworld.com and upon request from Art Clay World, USA.)

BRONZclay™

&

FASTfire
BRONZclay™

**are now brought
to you by**

Art Clay World USA!

**Contact us for all your metal clay
needs: silver, gold,
copper, and bronze!**

**Toll-free (in U.S.) 866-381-0100
708-857-8800**

www.artclayworld.com



BRONZclay™ and pearl necklace and earrings by Sherry Viktora
Photograph by Steve Augle