

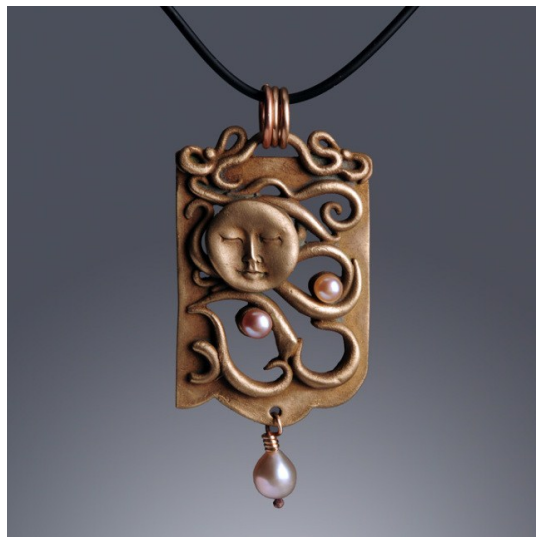


Now Offering



Contact us for:

Metal, polymer, glass clays
Resources • Swarovski • Resin
Wire • Tools • Textures • Molds
Gemstone Beads • Findings

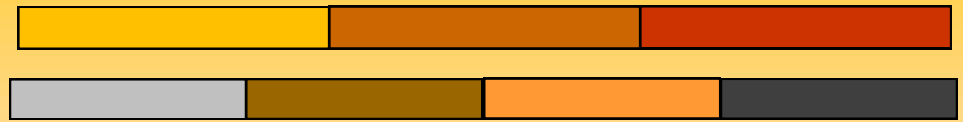


Goldie Bronze™ pendant by Jonna Faulkner.
Photo by Steve Rossman

Toll-free (in U.S.) 866-381-0100

708-857-8800

www.artclayworld.com



Goldie Metal™

A quick reference to working with the various varieties of Goldie Clays.



Brought to you by



Welcome to Goldie Metals™!

Goldie Metal™ is made from super-tiny metal particles, organic binder, and water, and can be used to create nearly any metal object you'd like. The clays can be sculpted, rolled, textured, extruded... Once dry, the item is refined, then fired. The resulting piece is 100% metal in exactly the shape the artist formed.

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. 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 weather stripping to conduit. Now, with the invention of bronze clay, our only limit is our imagination (and maybe the size of your firing pan!)

Goldie clays come in many varieties: Bronze (hard and soft), Roman Bronze, de la Rosa Bronze, Snow Bronze, Copper and soon, Lemon Brass, and Iron.

Finishing Goldie Metals™

Once fired, the piece is a solid piece of metal. As with other fired metals, it can be sawn, drilled, sanded, 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. Should the piece come from the kiln warped or curved, it can be reshaped gently with a rawhide or rubber mallet. Likewise, textures and shaping can be added post-firing.

Some pieces fire to a beautiful rainbow of colors; these are caused by the varying amounts of oxygen allowed to reach the clay during sintering. There is no simple way to predict or pre-determine these colors. Many artists love the colorful surprises they see, while others strictly want the general metallic color of the base metal they fired.

To bring out the clay's true metallic color and finish, use a stainless steel brush under running water, and brush well. For a very shiny finish, tumble the piece for at least two hours with stainless steel shot or shine specific areas with an agate or stainless steel burnisher. A flex-shaft is a wonderful tool for finishing, as the various tips and ends have different and specific effects on the metals.

Bronzes and copper can be carefully patinated with gentle heat from a handheld torch. Be careful not to overheat the finished items, or they will oxidize to an impossible-to-remove blackened color.



“Happy Sam” by Joy Funnell
Note the continuum of coloration on the piece;
this may occur during the firing process.

Safety and Precautions

Goldie Metals™ are non-toxic and do not contain any harmful chemicals, and there have been no reported allergic reactions to the handling of any of the clays. However, some artists are more sensitive to the metals in the clays, specifically copper, and may experience a naturally-occurring reaction where skin turns green (caused by interaction between the iron in your body and the copper in the clay). Do not ingest any of the Goldie Clays or intentionally breathe in the powders; we recommend wearing a dust mask while working on greenware and with the activated carbon. Always use proper protective items and use appropriate practices when working with kilns. Please see the MSDS for Goldie Metals™ for more specific information (available at www.artclayworld.com and upon request from Art Clay World, USA.)

Firing Goldie Metals™

To eliminate oxidation, Goldie Clay pieces must be surrounded by activated carbon during firing. Firing Goldie Metals™ is a multi-step process that uses low heat to vaporize the binder, then high heat to sinter the metal. The first phase of firing can occur open-shelf or as a single layer lying on top of activated coconut carbon. The second phase requires the pieces to be buried within the activated coconut carbon. The kiln does not have to be cooled to room temperature between phases.

Powder	Phase 1	Phase 2	Shrinkage
Bronze (hard or soft)	Ramp FULL to 670°F and hold 30 minutes	Ramp FULL to 1510°F and hold 40 minutes	8-11%
Roman Bronze	Ramp FULL to 670°F and hold 30 minutes	Ramp FULL to 1560°F and hold 90 minutes	10-12%
Snow Bronze	Ramp FULL to 670°F and hold 30 minutes	Ramp FULL to 1350-1370°F and hold 110 minutes (smaller kilns use higher temperature)	16-30% (depending on temperature)
de la Rosa Bronze	Ramp FULL to 670°F and hold 30 minutes	Ramp FULL to 1715°F and hold 90 minutes	11-14%
Copper	Ramp FULL to 1080°F and hold 30 minutes	Ramp FULL to 1740°F. Depends on thickness; hold 2 hours up to 2mm, 3 hours for thicker.	12-18%

Notes:

- Goldie Clays should be fired in a stainless steel firing container. Do not use a ceramic vessel, as ceramic does not disperse heat properly within the kiln, allowing for maximum interior temperature fluctuations.
- Always use acid-washed coconut shell carbon for Goldie Clays.
- Allow 1 inch of space between pieces and the wall of the firing pan. Allow at least 1/2 inch space between pieces.



Stainless steel firing pan, ACW item BZ-009

Troubleshooting

1. **The piece breaks after firing and black clay remains inside.** The item did not fully sinter in the kiln, meaning either the binder did not fully burn out or the sintering temperature was not high enough. First, try increasing the first phase by 10 minutes, making sure the piece is the color of dark pencil graphite at the end of this stage. Next, try increasing the amount of firing time in the second stage 30-50%. If pieces still break, increase the firing temperature by 50°F and return to the original firing time.
2. **The piece has bubbles on the surface after firing.** The kiln temperature was too high for the metal. Reduce the future firing temperature by 25° increments until the bubbles disappear.
3. **There are cracks in the piece.** Prepare a paste, or slip, the consistency of pudding. Apply the paste to the clean surface of the clay and allow to dry. Pack the cracks with clay, dry, and refine. Fire as per the metal's 2-stage firing schedule.

Suggested Tools for Working with Goldie Clays

Like other clays, Goldie Metals™ 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)



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

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 flexiStamp™ designs are available in deep, crisp rubber, or as low-relief heavy cardstock (ACW item number beginning with FS)

Helpful Hints

Goldie Metals™ are typical clays in that they begin 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) in a refrigerator when not in use.
- If you notice a color change to your clay after storage, don't worry. Knead the clay until it returns to a single tone, then keep working. Be sure to keep the clay air-tight between future uses.
- Rub a dab of conditioning agent 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.
- Sculpted 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.

Embellishing Goldie Metals™

Because of the firing requirements for Goldie Clays, they are not a good fit for firing natural gemstones in place. Cubic Zirconia, lab created rubies, sapphires, spinels, and lab corundum may work well; speak with your gemstone supplier for more information about stones and their general firing capabilities. However, if you desire to set natural gemstones, you will need to get creative with pre-formed settings or wire.

Pre-formed elements are simple to use, and can be embedded right into the clay. The rule is to use the same metal element as the clay; bronze clay should be fired with bronze findings or bronze wire. There are pre-made copper settings and findings for copper clay, too. Goldie Metals™ are also great candidates for any embellishment added after firing, including resins, beadwork, and enamels.



Goldie Roman Bronze™ owl
by Pat Waddington

Goldie Bronze™ and abalone
pendant by Sabine Alienor-Singery



Layers and Attachments

Unlike silver clay, Goldie Metals™ do not yet have a slip, paste, or syringe-type formula. You can create your own slip or paste by adding water to Goldie Clays, however, this does not always lend itself for a strong attachment. A product called Pastemaker is available which is non-water based, and can be added to the clay to create a paste which can then be used to add pieces together

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 permanent and reliable connections.

Goldie Bronze™ cuff bracelet
by Sabine Alienor-Singery

Drying Goldie Metals™

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. Of course, the clays can also be dried with a hair dryer, or left at room temperature overnight.

Once Goldie Metals™ are fired, they are much more difficult to finish, so the more pre-finishing work you can do, the better. The dried "greenware" stage is the best time for smoothing, filing, sanding, drilling, carving, and engraving.



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