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Art in Metal Clay

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Instruction Manual for Hadar's Clay™ One-fire Clays



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Introduction

Hadar's Clay One-fire clays have been developed to simplify the firing process compared to the Quick-fire clays. They can all be fired in one phase. The firing schedule lasts between 4-5 hours, depending on the firing temperature of the specific clay, as well as the size and the amount of clay fired in a single batch.

Hadar's Clay One-fire clays have a very long shelf life and nice consistency, are non-toxic, and do not contain allergenic ingredients such as nickel.

Hadar's Clay™ products come in the form of powder. The powder is already mixed with a binder and all you have to do is add water. The clay is very forgiving, soft, pliable, and sticks well to itself. It mixes quickly, with no mess.

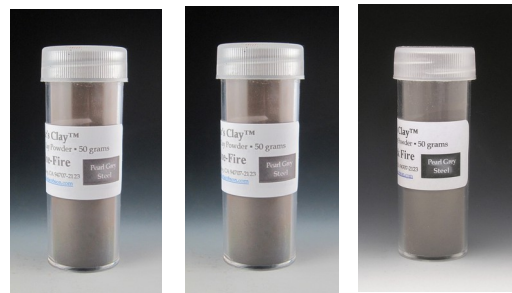
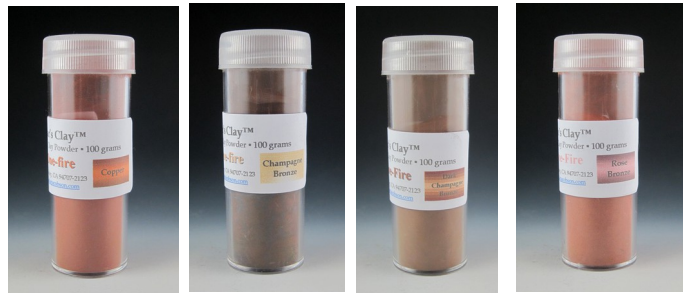
A video showing how to mix the clay can be seen at:

www.youtube.com/watch?v=IR72HKXsln4

One-fire High-fire Clays

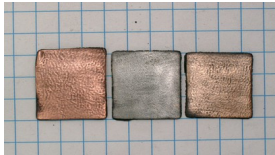
This group includes:

- One-fire Copper
- One-fire Champagne Bronze
- One-fire Dark Champagne Bronze
- One-fire Rose Bronze
- One-fire White Satin
- One-fire Low-shrinkage Steel *XT*
- One-fire Pearl Grey Steel
- One-fire Flex Clays:
 - Copper,
 - Dark Champagne Bronze,
 - Rose Bronze
 - White Satin
 - Low-shrinkage Steel *XT*
 - Pearl Grey Steel



Shrinkage

Champagne Bronze and Dark Champagne Bronze: flat pieces 6 cards thick shrink 30%, slightly more than Low Shrinkage Steel XT. Rings (tested at 6-card thickness) shrink 3 sizes. Rose Bronze and Copper: flat pieces 6 cards thick shrink 25%, rings shrink 1½ sizes.



Shrinkage comparison from left to right: Copper, Low-shrinkage Steel XT, Champagne/Dark Champagne Bronze.



Color comparison: left - Champagne Bronze; right - Dark Champagne Bronze.

One-fire Pearl Grey Steel shrinks considerably more than all the other High-fire clays – **about 30%**. It is recommended to either use it on its own at high-fire schedule or in a mokume-gane combination at mid-fire schedule (see below).



Shrinkage of One-fire Pearl Grey Steel compared to One-fire Copper.



One-fire Pearl Grey Steel in mokume-gane combination.

The same shrinkage rates apply to the One-fire Flex Clays.

Firing Schedules

For best results use a round stainless steel pet dish. **All Hadar's Clays need to be kiln-fired inside carbon, on top of a 1" layer of carbon, and covered by 1½-2" of carbon.** The best coconut shell carbon is available from our distributors in the US, especially www.pmconnection.com and www.metalclaysupply.com.

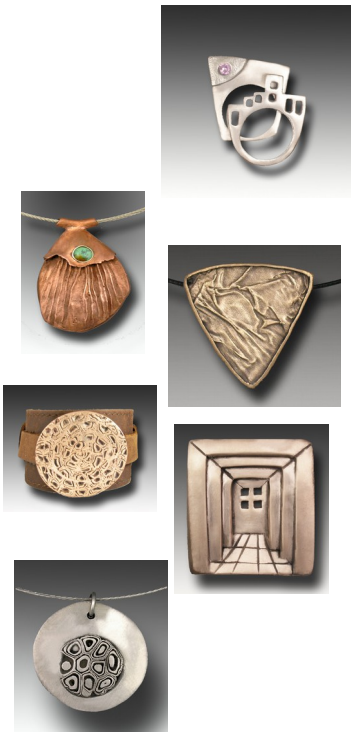
For all clays, a hold time at 1000°F/538°C (in a brick kiln); 1100°F/593°C (in a muffle kiln) is necessary to ensure a good burnout of the binder. The hold time depends on the amount and the size of the pieces being fired. The more mass fired in a batch (in terms of size and number of pieces), the longer the hold time should be. It is rarely necessary to hold more than 2:00 hours. This firing schedule can be programmed to fire in one phase. **See programming instructions at: http://artinsilver.com/One_fire_programming_instructions.pdf.**

Here is a general firing schedule which applies to all the One-fire clays:

<p>Brick Kiln</p> <p>Ramp at 1800°F/1000°C per hour to 1000°F/538°C (first hold temperature)</p> <p>Hold 2:00 hours</p> <p>Ramp at 1800°F/1000°C per hour per hour to second hold temperature</p> <p>Hold 2:00 hours</p> <p>Muffle Kiln</p> <p>Ramp at 1800°F/1000°C per hour to 1100°F/593°C (first hold temperature)</p> <p>Hold 2:00 hours</p> <p>Ramp at 1800°F/1000°C per hour per hour to second hold temperature</p> <p>Hold 2:00 hours</p>
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The table below shows the *second* hold temperature for each clay. All of them require a hold time of 2 hours at 1000°F (brick kiln) or 1100°F (muffle kiln) before ramping towards the second hold temperature.

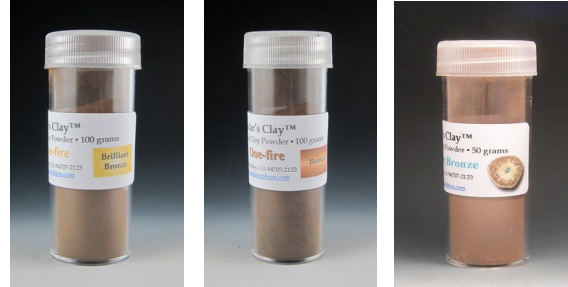
Clay	Color	Firing temperature	
		On its own	Combined with other high-fire clays
White Satin	Silver-like	1680°F (brick) 1730°F (muffle)	1750°F (brick) 1800°F (muffle)
Copper	Red-orange-brown	1900°F (brick) 1950°F (muffle)	1750°F (brick) 1800°F (muffle)
Champagne Bronze	Champagne	1720°F (brick) 1770°F (muffle)	1750°F (brick) 1800°F (muffle)
Dark Champagne Bronze	Darker than Bronze	1700°F (brick) 1750°F (muffle)	1750°F (brick) 1800°F (muffle)
Rose Bronze	Pinker than copper	1720°F (brick) 1770°F (muffle)	1750°F (brick) 1800°F (muffle)
Low-Shrinkage Steel <i>XT</i>	Silvery-Gray	1900°F (brick) 1950°F (muffle)	1750°F (brick) 1800°F (muffle)
Pearl Grey Steel	Silvery-Gray	1750°F (brick) 1800°F (muffle)	1750°F (brick) 1800°F (muffle)



One-fire Mid-fire Clays

This group includes:

- One-fire Bronze
- One-fire Brilliant Bronze
- One-fire Smart Bronze
- Mokume-gane sampler
- One-fire Flex Brilliant Bronze



Shrinkage

Tested at 6-card thickness, both One-fire Bronze and Brilliant Bronze shrink 15%; rings shrink 1½ sizes. Smart Bronze shrinks 23.5%; rings shrink 2 sizes.



Firing Schedules

The firing schedule is the same as described at the top of p. 4. The table below shows the *second* hold temperature for each clay. All of them require a hold time of 2 hours at 1000°F (brick kiln) or 1100°F (muffle kiln) before ramping towards the second hold temperature.

Clay	Color	Firing temperature	
		On its own	Combined with One-fire Copper, One-fire Bronze or Brilliant Bronze, Pearl Grey Steel (mokume-gane)
One-fire Bronze		1510°F (brick) 1560°F (muffle)	1510°F (brick) 1560°F (muffle)
One-fire Brilliant Bronze	Gold-like	1460°F (brick) 1510°F (muffle)	1510°F (brick) 1560°F (muffle)
One-fire Smart Bronze	Champagne-like	1420°F (brick) 1470°F muffle)	N/A



These three types of bronze can be fired about 40°F lower than the suggested temperature and will still be strong.

One-fire Low-fire Clays

This group includes:

One-fire White Bronze

One-fire Flex White Bronze



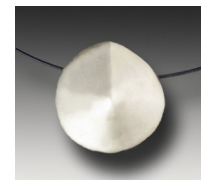
Shrinkage

All varieties of White Bronze hardly shrink. Their big advantage is their silver color and the fact that they do not tarnish. However, since they are brittle when fired, it is not recommended to use them on their own. See instructions for firing them with other metals in my blog posting: “New Ways of Working with White Bronze” (artinsilver.com/blog/2015/03/22/new-ways-of-working-with-white-bronze/).

Firing Schedule

The firing schedule is the same as described at the top of p. 4. The table below shows the *second* hold temperature for each clay. All of them require a hold time of 2 hours at 1000°F (brick kiln) or 1100°F (muffle kiln) before ramping towards the second hold temperature.

Clay	Color	Firing temperature	
		On its own	Combined with other clays
One-fire White Bronze	Silver	1350°F (brick) 1400°F (muffle)	1350°F (brick) 1400°F (muffle)
One-fire Flex White Bronze	Silver	1350°F (brick) 1400°F (muffle)	1350°F (brick) 1400°F (muffle)



What are Flex Clays?

One-fire Flex Clays are a new variety of Hadar's Clay, developed in summer 2015. They are identical to other One-fire clays in consistency (powder), shrinkage, and firing schedule. The difference is that when they are rolled to dry sheets, they stay flexible, which makes them especially fit for use with a cutting and embossing machine, such as the Silhouette, as well as with punches and scissors. They can be use in combination with One-fire clays.

Mixing

Unlike the other One-fire clays, there is no need to mix the whole jar. When mixing, it is important not to over-wet. If you added too much water, add some more powder from the jar.

Consistency

The consistency of the mixed clay can be adjusted according to your needs: One-fire Flex clays can be added to One-fire clays to make them more flexible; One-fire clays can be added to One-fire Flex clays to make them less flexible.

Drying

Rolled sheets can be dried on the warmer. They hardly warp. Before using them let them cool to room temperature.

Reconstituting

It is best to dry the clay completely, grind it in a dedicated coffee grinder, and re-mix it with water.

