



COOL TOOLS

## Magic Carbon Instructions



### How to Prime Magic Carbon

New carbon needs to be primed before firing. Follow these simple instructions to prepare a new pan of carbon.

1. Fill the stainless steel firing pan with Magic Carbon, leaving about 1" headspace.
2. Place the uncovered firing pan on posts in the kiln. If your kiln has a peephole, plug it.
3. Fast ramp to 1650F, hold 30 minutes. Leave the kiln undisturbed until the interior temperature is 300F or less.
4. Remove the firing pan from the kiln and place on a trivet until the outside of the pan is cool enough to touch. The carbon is now ready to use.

When topping off an existing batch, a layer of 1" or less added to the top of the pan does not need priming.

### Basic Firing Guidelines

- Maximum load depends on the container size. A standard steam table pan, 7 x 6-1/2 x 2-3/4 tall, can hold about 250 grams of clay.
- Pieces should be dry before firing.
- Pieces should be placed in a single layer to avoid overloading the carbon.
- Fire samples to verify target temperature. The target temperatures given are a good starting point. Magic Carbon tends to allow firing at a lower temperature than other carbons. Instructions on determining your kilns ideal target temperature are listed below.
- Always fire metal clay with the lid on, but a bit askew to allow openings of about 1/4" for air. Better yet, use a slotted lid.

### Hold Times

Hold times depends on the desired strength of the finished piece. For most pieces, of any thickness, a 2-hour hold is sufficient.

- 2 hour hold: for most pieces made of Bronze or Copper Clay, any thickness. Total firing time: about 3-1/2 hours.
- 3 hour hold: for bronze cuff bracelets and anything that will be dapped or formed, any thickness. Total firing time: about 4-1/2 hours.
- Follow standard firing schedules for Silver Clay & PMC PRO.

### Determining Target Temperature

Your kilns target temperature will depend on the clay being fired and the wattage of the kiln, but ranges from 1490F to 1550F for bronze clay, and from 1600F to 1700F for copper clay. When bronze or copper clay is overheated, it can result in a slightly grainy surface, dents on the back of the piece, bubbles or partial melting of the metal. Under-fired pieces can be extremely brittle or unsintered, so it's important to take the time to test your kiln before firing any of your hard work. The easiest way to determine your kilns ideal temperature is by firing a few small test pieces. An instruction for test firing along with a grid of common target temperatures is provided as a starting point. Please note that any brand of bronze clay will work with this carbon and this schedule. Any brand of copper clay will also work with this schedule.

### Making Test Strips

Test strips can be any size you like. I make mine about 1/2" wide x 1-1/2" long and 5 cards thick. A template or shape cutter is a good way to get identically size pieces. I prefer to use a rectangular shape as an easy way to gauge shrinkage of the samples. The test strips should be completely dry before firing.



# COOL TOOLS

## Kiln Wattage

If you do not know the wattage of your kiln, you will find a manufacturers plate attached to the side or back of the unit. The plate will give you the volts, amps and wattage of the kiln.

## Kiln Type

- Ceramic fiber kilns are easy to identify because the heating elements are not visible when you look inside the kiln. The interior is a shell with the elements molded inside.
- Brick kilns are constructed of individual bricks that are cemented together and are easily recognized.

Kiln Type	Wattage	Bronze Clay	Copper Clay	Hold Times - All Clays
<b>Brick</b>	1110 Watts	Full to 1525F	Full to 1650F	3 hours
	1440 Watts	Full to 1525F	Full to 1650F	3 hours
	1680 Watts	Full to 1500F	Full to 1625F	3 hours
	2000 Watts	Full to 1490F	Full to 1600F	3 hours
<b>Ceramic Fiber</b>	1110 Watts	1000F/hr to 1525F	Full to 1650F	3 hours
	1440 Watts	1000F/hr to 1525F	Full to 1650F	3 hours
	1680 Watts	1000F/hr to 1500F	Full to 1625F	3 hours
	2000 Watts	1000F/hr to 1490F	Full to 1600F	3 hours

## Firing Test Strips

- Prime your carbon.
- Place a single strip in the center of the firing pan, buried about 1" below the surface of the carbon.
- Fire at the starting point schedule for the kiln that matches most closely to your model.
- Allow the kiln to cool, or crash cool to 800F before removing the container to a trivet to cool. Remove the lid to expedite cooling.
- When all red glow is gone from the carbon, the test strip can be removed with a slotted spoon to cool. Place on a steel bench block to speed cooling of the fired test strip.

## Testing the Fired Strip

A successful firing will pass a visual test, an audio test and a bend test.

**Visual Test:** The test strip should be free of cracks, splits and bubbles. All sides should be smooth and free from dents.

**Audio Test:** when dropped onto a steel bench block, the test strip will have a bright ring to it...it will sound like metal. Becoming familiar with the right "ring" will take some time to recognize, but it easy to hear the difference once you know what you are listening for.

**Bend Test:** The test strip should be able to be bent at least 90 degrees without breaking or showing signs of cracking. To test the fired strip, use a pair of bending pliers and bend the sample, or use 2 pairs of pliers. It should bend smoothly and easily to 90 degrees. Follow the chart below to determine if your target temperature should be increased or decreased.

## Firing Results & Target Temperature Adjustments

Result	Remedy
Grainy surface	Lower the target temperature by 15 degrees
Dents from carbon on back	Lower the target temperature by 15 degrees
Bubbly surface	Lower the target temperature by 50 degrees
Splits or cracks	Slow heating to 1000F per hour. If the problem persists, slow heating to 750F per hour
Breaks when bent, break is grainy, but feels metallic	Extend your hold time by 1 hour
Breaks when bent, insides are powder or dark	Raise the target temperature by 25 degrees. If the problem persists, add additional 25 degrees