

# Fast Ash

Domesticating a Kiln dragon

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# THAR BE... DRAGONS?

For millennia potters have gathered around the fire and passed along the legends of dragons in their kilns. Most of us will never forget our first encounter with the mythical beast. For me, it was a brisk fall night at a kiln built by a college friend. I signed up to feed the dragon during the night shift. In the hours after midnight, Orion, the hunter, was traversing a star-filled sky. On a small patch of earth, in northern Indiana, several mortals had gathered voluntarily to become slaves to an immortal beast that devoured prodigious amounts of fuel as it raged and breathed fire. Kiln temperatures defied the cool of the night as embers flew up and mingled with the stars.

Since that first experience, I fell under the spell of the dragon and the entire wood-firing process. A few years after leaving college, I had the great fortune of meeting a dragon from half way around the world. I helped build and fire a Korean style Thungamma in the mountains of North Carolina. During the firing each time we approached the large open fire-mouth to feed the beast, it nearly took our breath away. Once again my spirit was tempered by the fire and the experience.

What can a part-time clay artist with minimal studio resources and space do? Large pet dragons don't fit in with neighborhood covenants. A break came for me when an acquaintance was going through a divorce. He was very interested in getting rid of HER pottery supplies that were taking up space in HIS garage. In exchange for several pots, I was able to acquire a treasure trove of firing supplies, glaze chemicals and around 150 soft fire brick.

Still under the dragon's spell, I began experimentation. If thousands of fire brick can be used to build a dragon's lair and create an enormous kiln, I may be able to do something on a dramatically smaller scale. I wondered, "Do kiln dragons come in extra small?"

Ninety bricks, a piece of stove pipe, and a salvaged kitchen rangehood fan later, I met a new miniature dragon that has become a close friend over the last decade. Together, we usually can flatten cone ten in two to three hours! This diminutive beast understandably has a much smaller appetite. Rather than devouring armloads of 5' slab wood, my hatchling consumes only about three (5 gallon) buckets of split wood, salvaged from residential construction sites. (Equivalent of 17 board feet of lumber.)

Although I have been firing this kiln for over a decade, in the last several years I have had the privilege of introducing wood-firing to several other ceramic artists and students. Whereas various large kilns may need an entire community to fill and fire, this small dragon's nest may be set up, fired, cooled, unloaded, and taken down all in a single day. Yes, cone 10 wood-fired stoneware in a Raku time frame!

The domesticated dragon that resides in my *Fast Ash Kiln* does not fully duplicate the incredible range and style of natural ash-build-up that may be achieved through week-long firings. However, this process does put wood-firing within the reach of students and other wanna-be wood firing potters!

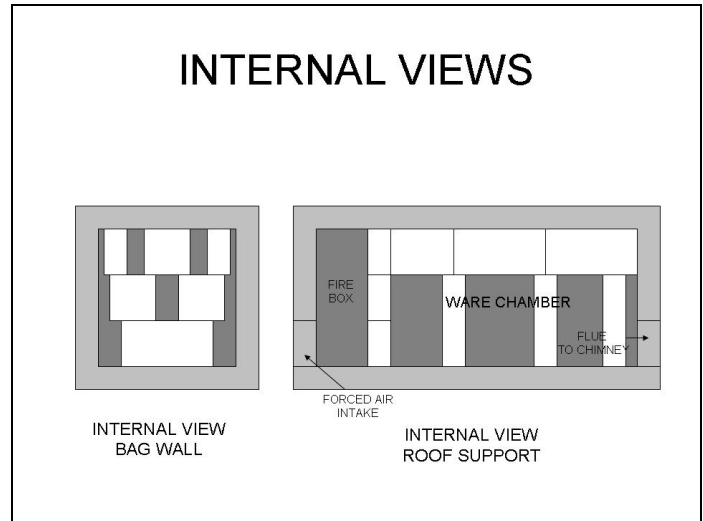
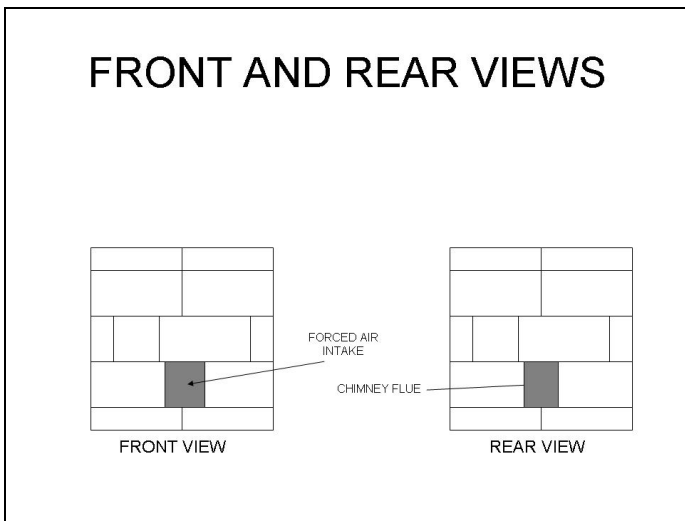
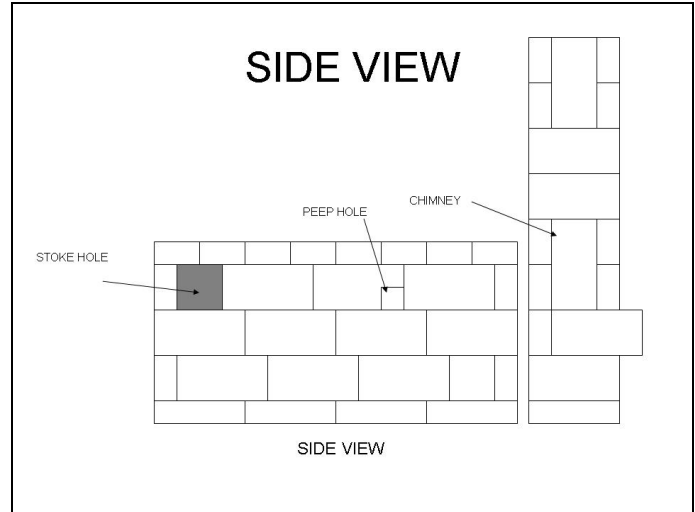
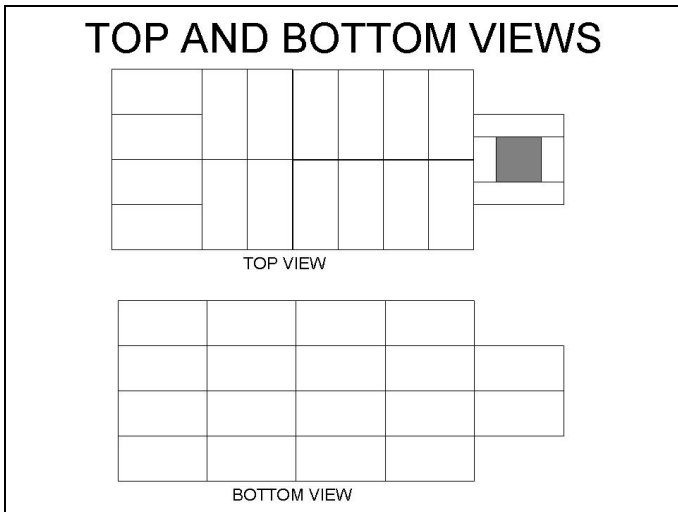
- Tim Martin Spring 2005



## Constructing and Firing the *Fast Ash* Kiln

The typical configuration for my 3.25 cu ft. *Fast Ash* wood-fired kiln uses no more than 100 insulating fire brick. Since this dry-stacked kiln is not a permanent, it is possible to set up, fire, cool down and clean up all in one day. I and acquaintances have achieved similarly successful results with larger and smaller variants.





### The Foundation:

Any clear flat surface will suffice for a foundation. I have successfully fired on dirt, cement driveways and sidewalks, or bricks. Minor soot stains may be evident after a firing, so I typically will make a small platform out of 8X8X16 concrete blocks. Nine concrete blocks work nicely when arranged in a three by three array (24" X 48").

### The Floor:

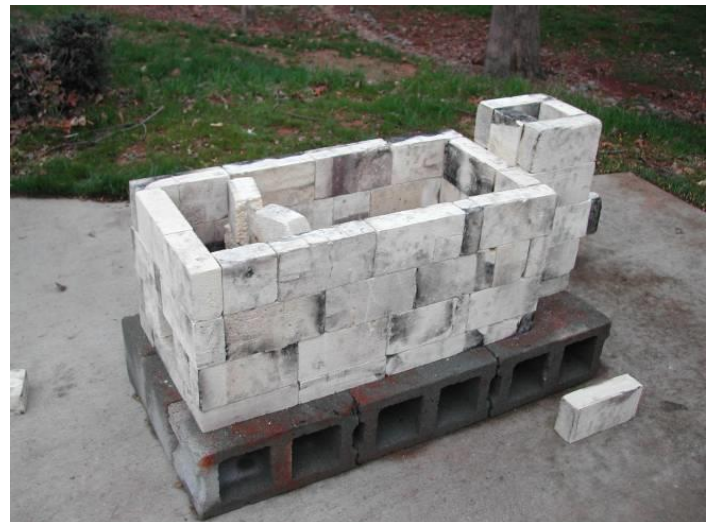
The floor dictates the size of the kiln. Start with a four brick by four brick array 18" X 36" In addition to the floor, the chimney base (2 bricks) are centered at one end. (Note: All dimensions listed are standard fire brick size of 4 1/2" X 9" X 2 1/2")





### **The Walls:**

The walls are made by placing bricks on edge along the perimeter of the floor. For the first two rows, try to interlock corners and stagger the joints between courses. Several bricks are cut to make the flue opening and the opening for air (and/or blower). Both openings are centered on each end along the bottom course. The third course of brick includes a stoke hole and peep hole. The stoke hole is on one side of the top course as far as possible from the chimney. The stoke hole is made with a half brick or by cutting a brick on an angle. The angle cut makes for easy removal and replacement of the brick during high temperature stokes. The peep hole may be made full height with  $\frac{1}{4}$  of a brick or by cutting a corner ( $\frac{1}{8}$ ) off a full brick. (See side view) Handles on the stoking and peep hole bricks are made by screwing a 3" screw approximately 1" into the bricks. I also cut a small corner off one brick for a pyrometer thermocouple. (Note: Soft brick may be easily cut with a hand saw.)



### **The Interior:**

The front wall of the kiln and the bag wall define the fire box. Build the bag wall out of scraps of broken or miscut brick. If a blower will be used, try to ensure that there will be no direct air flow from the air intake to the ware chamber. (See Internal views) Construct the bag wall so it slightly overlaps the floor joint between the first and second row of bricks. (This will make the fire box approximately 6" X 13") Depending on the roof design, internal roof supports may be needed. The simplest method is to use kiln furniture or ½ bricks cut lengthwise (soaps) to form a support bridge along the center of the ware chamber. (See internal view)

### **The Roof:**

I typically just lay bricks flat to form a roof, although I have also experimented with a bolted "sprung" roof. A stacked roof is made with 4 bricks over the firebox; spanning from the front wall to the center of the bag wall. For the roof over the ware chamber, bricks span from an exterior wall to the central support bridge. (See top view)

For a sprung roof, holes are drilled through brick; then threaded rod (3/8" or greater) is inserted through the brick. Washers, springs, washers and nuts are tightened on each end of the rod. Four rows of bricks spanning from the sides is preferable to two rows bolted along the length of the kiln. Although a sprung roof significantly increases the usable space of the ware chamber, this method has a limited life because the bricks break due to expansion and contraction during firings. Others have used old kiln shelves to support the roof.

### **The Chimney:**

The chimney is important to establish proper draft for the firing. The base of the chimney is 9" X 9" and the internal flue size is a 4" square. The chimney is constructed with at least 4 units of 6 bricks each. Each unit is constructed with two vertical bricks on opposite sides with two horizontal bricks on each of the other sides.

Note: a few pieces of steel wire around each unit will greatly increase the stability of the chimney during natural heating expansion. Alternate this pattern with a 90° rotation for each higher section. This method may be used to build tall chimneys; however, since acquiring a piece of stainless steel stove pipe, (Caution: Black or

galvanized stove pipe does not withstand the extreme heat!) I typically use 3 units and extend the chimney with four feet of stove pipe. If a pipe is used, fasten guy wires from the chimney to 3 points around the kiln to prevent the wind from toppling the chimney at high temperatures.

### **The Fuel:**

Although I have fired this kiln with many types of wood, I prefer to use yellow pine. Yellow pine is typically used in the southeast as a structural framing wood and many contractors are delighted for someone to clean up their construction site. Cut framing lumber scrap into 6-8" blocks, then split those blocks with a hatchet to approximately 1" splints. A typical cone 9 or 10 firing will consume three, 5 gallon buckets full of split wood. This is approximately equivalent to 17 board feet of lumber.

### **The Firing**

For the best wood fired/ash glazed effect, the kiln should be fired to cone 9 or 10. In a typical firing, starting with bisque ware, I reach cone 9 in 2 ½ to 3 hours. I have reached temperature in as little as 45 minutes...although I do not recommend this, unless you have a very durable clay body!

To start the fire, light small kindling in the firebox. Drop several pieces of burning newspaper down the chimney. Heating the chimney quickly establishes a draft through the kiln. Achieving the first 2000° F is easy, taking about 1/3 of the wood (1 bucket). This may easily be reached in 1 to 1 ½ hours. It may be beneficial to slow the temperature climb around quartz inversion temperature. (Approximately 1000°F) At this burn rate, maintain a reduction atmosphere by watching the chimney smoke. Stoking is necessary with 2-4 splints every 1-2 minutes or when the black smoke starts to dissipate.

Above 2000° F the work begins. Timing and the size of the stoke depends on the quantity and location of the ware in the kiln. It is important to find the rhythm of the firing as the best stoking may be 2-3 splints of wood every 30 seconds. It is very easy to over stoke; a large handful of wood may produce heavy reduction and result



in a 100-200 °F temperature loss. An oxidation period after a larger stoke may be useful for increasing temperature. A pyrometer is very beneficial to help monitor the quantity and timing of the stokes. I have fired without a pyrometer by monitoring the reduction level at the chimney. Although not necessary, I typically finish the fire with a small fan blowing into the fire box. The fan will help to clear the ash pile and produces some natural “fly ash.”

### **Faking the long fire:**

Since the duration of this firing is so short and the quantity of wood so small, natural fly ash will not be a major decorative element in a *Fast Ash* firing. For a quick “wood-fired” finish, I use a two-step process. First, bisque ware is soaked in a lye “dip”. To make the “dip”, fill a bucket with wood ashes; create a slurry by adding water to the level of the ashes. After soaking for a day, strain the ashes from the slurry. (Note: In appropriate concentration this is a very caustic solution.) Since the soluble chemicals will deposit on the surface of the ware as it dries, it is important to avoid or minimize handling after dipping. In addition to the dip, I apply ash to the wet pot by sifting it onto the ware through a small screen. As much as possible I randomize the quantity and location of applied ash to imitate the spontaneity found in a natural firing. I also get excellent results with carbon-trap/shino glazes, ox-bloods and many other reduction glazes.

To any student of wood-fired ware, it will be clear that the small *Fast Ash* kiln cannot completely duplicate the multitude of surface textures and colors that may result from a multi-day wood firing. In spite of the limitations, I have achieved fantastic results creating Wood-fired stoneware on a Raku time scale.