

Guide to Gas Firing | FAB "BAILEY" gas kiln

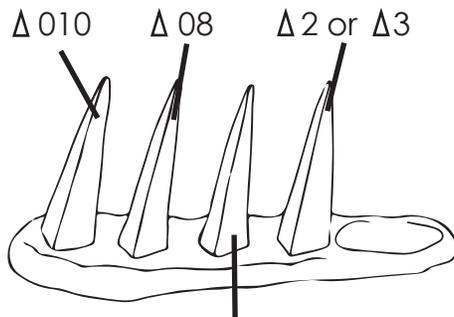
The "Bailey" is equipped with an automated firing settings similar to the electric kilns, but it cannot be "set it and forget it". You will still need to babysit the firing for the whole duration and adjust the gas and air as needed. If at any point the Ceramics or Sculpture Lab Tech deems the firing unsafe, they will take over the firing.

A. Before you fire...

1. Pre-make **cone packs**

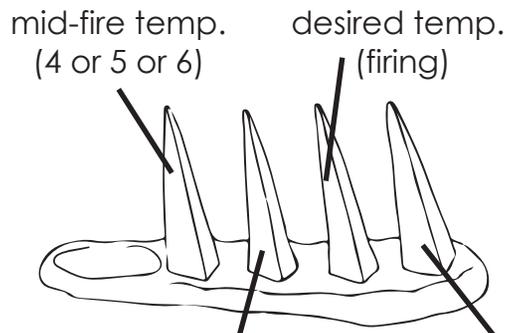
- need one set per peep minimum
- set up according to diagram provided and to the needs of the desired firing

FRONT



bisque temp
(Δ06 or Δ05 or Δ04)

BACK



1 below desired temp. (guide)

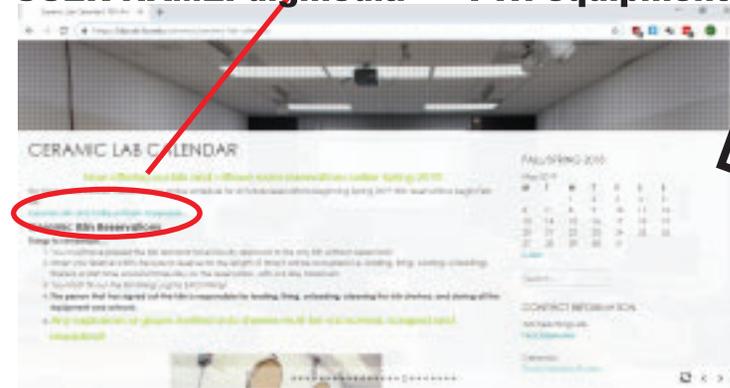
1 above desired temp. (guard)

* "Front & Back" packs will be one in front of the other when you peer through the peep hole. "Front" is the one closest to you, "back" is behind it. Point the packs in opposite directions so you can see the cones as they fall.

Sign-up for kiln on kiln calendar at:

<https://labs.art.fsu.edu/ceramics/ceramic-lab-calendar/>

USER NAME: digmedia PW: equipment!



this schedule trumps all other schedules or arrangements

- * reserve at least 4 days: (1) load & candle (2) fire (3) cool down (4) unload & clean up

You will need to be there all day during firing unless otherwise pre-scheduled and documented

- 2. Put cone packs in small (3" x 5" minimum) pre-fired **boats** (dish with sides to catch molten cone)

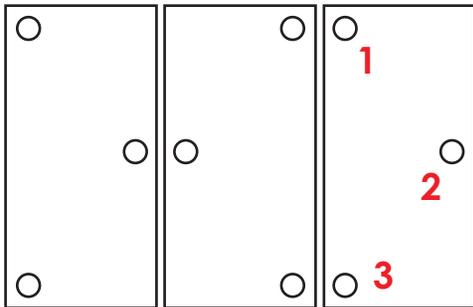


boat example

- 3. Check shelves in case they need to be scraped and re-washed
- 4. Find and check blow torch (for lighting burners)

B. Loading the kiln...

1. **CHECK** the kiln shelves for glaze, sand and re-wash, and kiln for debris and vacuum if necessary
yes, this is the last person's job, and if it's not this way, alert the lab tech
2. Make sure the glaze on pots are 1/4" from bottom
 - wipe foot of pieces with damp sponge to remove glaze
 - if it looks like the glaze is thick, stilt or wad and/or sand the shelf below the piece
3. Use 3-post configuration for each shelf
 - remember posts should line up when looking at the kiln in profile (post stacked above the other)
 - make sure shelves are level. Use cookies or wadding



3-post configuration distribution from above

4. **FILL THE KILN!** and evenly distribute pieces
 - leave at least 2" between pieces to allow for air movement and even heat distribution
 - use clean hardbrick if there isn't enough work
 - make sure side bricks are placed on bottom shelf labelled "BRICK" in iron oxide
5. Base layer should be 8-10" tall for maximum air flow. Anything taller should go on the very top or stagger shelf stacks.

Example of properly loaded kiln



full kiln with gaps between the work

any pieces above 8-10" on top unless too heavy

posts stacked above one another

bottom is 8-10" tall

6. **REMEMBER** to consider cone pack visibility when loading (check heights). Cone packs should be in boats in front of all peeps at minimum.
7. Double check the tops of pieces won't touch the bottom of shelves. Give yourself a gap to allow for even heat distribution and air flow.
8. **MAKE SURE THE SHELVES ARE STABLE!** You do not want to push in the door and the whole thing comes crashing down.
9. Close the door **COMPLETELY**, there should be zero gap. Secure door with clamps: 2 top, 2 bottom
 - if door doesn't close, check track for debris.
 - do not force shut
 - ask for help- you can destroy the kiln otherwise

CONTINUE...

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EXHAUST
must be **ON**
the entire
time the
GAS is ON

B. Loading the kiln continued...

10. Fold up yellow track
11. Post laminated yellow sign on outside of kiln with magnet
 - Please don't melt the sign
 - include your name and contact information in dry erase marker on yellow sheet
12. Set orange cone in front of kiln if available



C. Lighting the kiln... let's fire it up!

1. **Ventilation** and do in this order
carbon monoxide injury in real and you don't want to make a bomb
 - a. Open roll door ~2 ft. high and secure chain



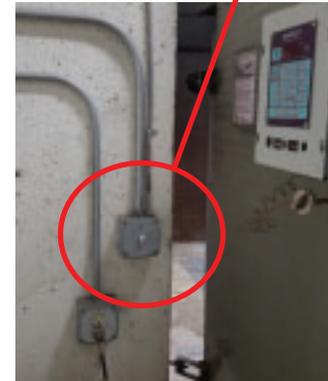
2' gap

- b. Turn on foundry exhaust fan, toggle flap to right



sandblaster

- c. Turn on power and kiln exhaust switch behind kiln



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C. Lighting the kiln...let's fire it up!

2. Turning on the gas

- groove in the nut on the gas line is "on" when in line with the pipe
- use the gas valve tool or a crescent wrench to turn it on/off

groove is line in square nut

in this image it is partially open



gas valve and line

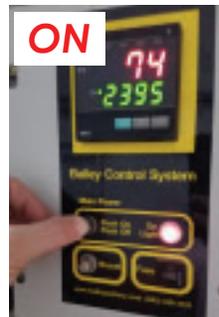


gas valve tool

If you smell ANY gas, turn it off and immediately notify the lab tech in sculpture and/or ceramics!

3. Turning on the Control Panel

- make sure kiln exhaust switch on the wall is "on"
- you will hear the exhaust fan in the kiln
- Press "on" button on right control box
- main power switch



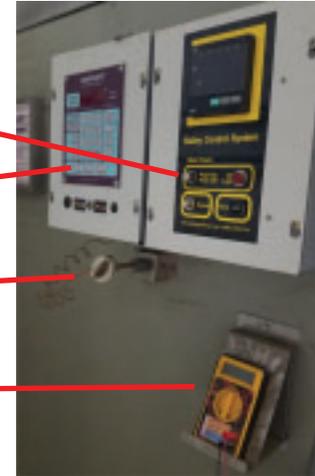
Control Panel Diagram

main power

computer control

thermocouple

oxygen sensor



- Press "reset" button directly below "on/off" button on the same panel
- this turns on the computer that controls the main burners and allows for pre-sets



OFF



ON

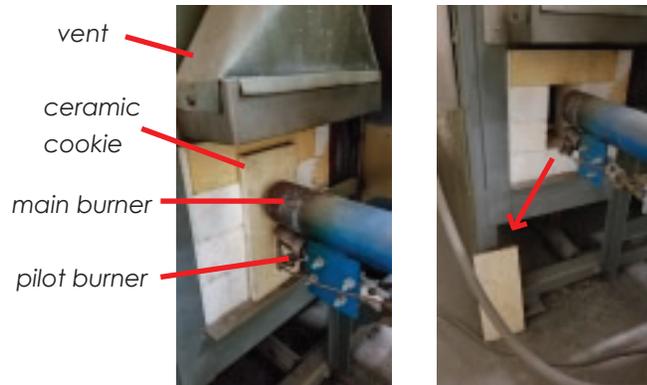
- set the computer (right controller) to "manual" with the toggle switch
- manual should be used when candling and during overnight heating to fire the next day, can be used when firing



C. Lighting the kiln...let's fire it up!

4. Lighting the PILOT BURNERS

- a. Remove ceramic cookies from in front of the burner ports and place on floor below them



- b. Open damper all the way by sliding it out
- damper is part of the chimney (above burners)



peeps should be plugged

- c. Rotate black gas knob 90° to open the lines for pilot
- they are open when you can depress them



- d. Start up blow torch and hold to the front of the pilot burner
- you do not have to hold the flame directly to the burner or thermocouple (small rod protruding from face of pilot burner)
- you may have to hold it there for up to 30 seconds to warm up the thermocouple so it will allow the solenoid to open the gas valve (that's the small greenish box near the black knob)
- e. Depress the black knob while torch flame is in front of pilot burner until the flame catches and stays on if you let go of the knob



- f. Once pilot is lit, you don't need to turn on the air to draw the flame into the kiln
- g. Return the knob to the "ON" position / or when you can't press it down
- this allows for gas to flow to the main burners

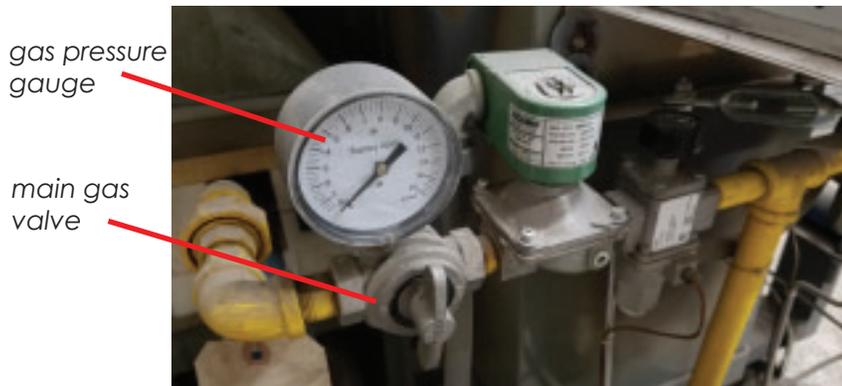
NOTE: pilots are great for drying the work over a long period of time, but they are insufficient to pre-heat the kiln to fire the next day (max. temperature reached ~400° F after 12 hrs.)

D. Firing...

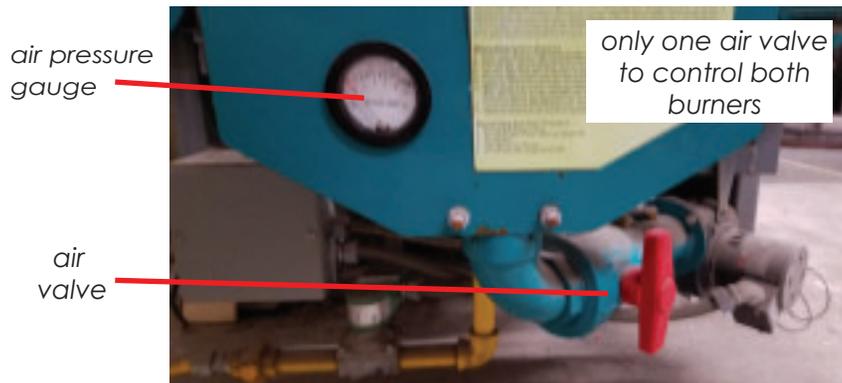
If you are firing in a "program" mode (pre-set) then you will need to flip toggle switch to "program" (left) before turning on the burners. Otherwise, it will turn the burners off. If you are firing in "manual" mode continue to instructions below.

1. Turning on MAIN BURNERS

- a. Since the pilot flame is on, you just need to turn the silver valve under the dial (shows gas pressure) until the main burner ignites then adjust dial until desired pressure/flame



- b. Turn red air valve until you get desired air flow - the higher the reading the lower the air rate



Always use a kiln log (red binder) to record your firing. Previous firing logs should be in the binder for your reference. Check what others have done to successfully fire before you start your own. No sense in reinventing the wheel.

- c. Continue on with firing using desired schedule, check kiln every hour

2. How to set a PROGRAM

Remember: *this is not an automatic firing like the electric kilns. It just manages the firing rate with the burners, you will still need to monitor and adjust gas, air and damper during the firing. Great for learning.*

- a. On Bartlett touch pad, light should be on. If not, you will need to hit the "reset" button on the other panel.

- b. Pre-Set Programs
Quick Guide

ex: Cone 10 Glaze on bisque

1. Press "START/STOP"
2. Press "QUICK GLAZE" in cone fire square, press "ENTER"
3. Press "1-0" for desired cone, press "ENTER"
4. Press "ENTER" for no hold, make sure it flashes "0"
5. CPL will flash, press "ENTER"
6. Press "START/STOP" to start firing, flashes "-ON-" and burners will click on



***SEE BARTLETT MANUAL FOR MORE INFORMATION ABOUT PRE-SETS AND RAMP FIRING MODES**

E. After the firing...

Shut down and close up kiln

1. Shut off metal gas valves and red air valve.
2. Push the "ON/OFF" button on the right control panel to turn off controllers
3. Turn off kiln exhaust fan
4. Replace cookies in front of burners
5. Shut damper completely
6. Put in peeps
7. Switch off foundry exhaust fan
8. Shut roll door and secure chain

kiln will be cool enough to unload in ~18 hrs depending on load

F. Unloading...

Unload once kiln is under 200°F, otherwise you could cause cracking of wares

1. Note any unusual results on the kiln log, some may be contributed to kiln set-up and can be adjusted
2. Carefully remove objects and shelves working top to bottom. Wear gloves if work is too hot to handle or just wait more...
3. **Clean and/or rewash shelves**
4. Put shelves and posts back in metal cabinet near metal shop except 3 base shelves. Clean those and replace.
5. **Vacuum the inside of the kiln** including the floor, around bag wall, under base shelves, etc.

Take ALL of your work. Do NOT leave anything for someone else to deal with afterward. **RETURN THE CART**



What is a clean kiln?
This is still messy

PLEASE
RESET FOR THE NEXT
USER, DON'T BE THAT
PERSON

What is a clean kiln shelf?



ask ceramics tech for instructions on how to properly grind/clean shelves

TIPS FOR A SUCCESSFUL FIRING

General Gas Firing Tips

CHECK LOGS FIRST! If you find one that worked out to your temperature/reduction, do as they did.

When firing, you want good pressure (air pushing out) from your peeps. You should feel it from about 3" away.

Control kiln conditions with damper. Push in if not enough pressure, or reduction is desired. Open if too much pressure or reduction, you'll notice flames blowing back at the burners from the port holes. Don't let it do that.

Adjust gas and air a tiny bit at a time, use damper more.

After every adjustment, give it 10-15 minutes before making another change. It takes some time to see the effects of your adjustments.

Only adjust one thing (damper, gas, air) at a time, otherwise you won't know what exactly did what.

Look at your flames for information: oxidation is a short "bushy" blue flame with orange flicks- it's louder too, reduction is a long snakey flame mostly orange/yellow. In a heavy reduction, you can see flames (especially green ones) sneaking out of any ports they can: around the door, peeps, between bricks...

Follow the Val Cushings firing schedule graph for a successful firing rate. Never fire over 12 hours after cone010. It could damage your work. Keep track of your rate on the kiln log.

Reference both the temperature and cone packs. That is why we have thermocouples/pyrometers.

Specific Bailey Firing Tips

The Bailey likes to be hot on the bottom, make adjustments accordingly.

This kiln is best with the damper closed more than one would expect. Reduction will help to even out the temperature.

Use the oxygen sensor along with the flame readings. It's best to have both sets of information when figuring out what to do next.

Gets hot and fast if you aren't careful. Pay attention to your gas/air ratio in the beginning even on a program.

If on a program and you want to change the gas, the gauge will turn off when the computer cuts the burner, so you'll have to have good timing.

Works best if you load it heavy on to the top.

Make sure the two bricks are where the markings are on the base (one on each side of the first/furthest shelf). It helps with air circulation.

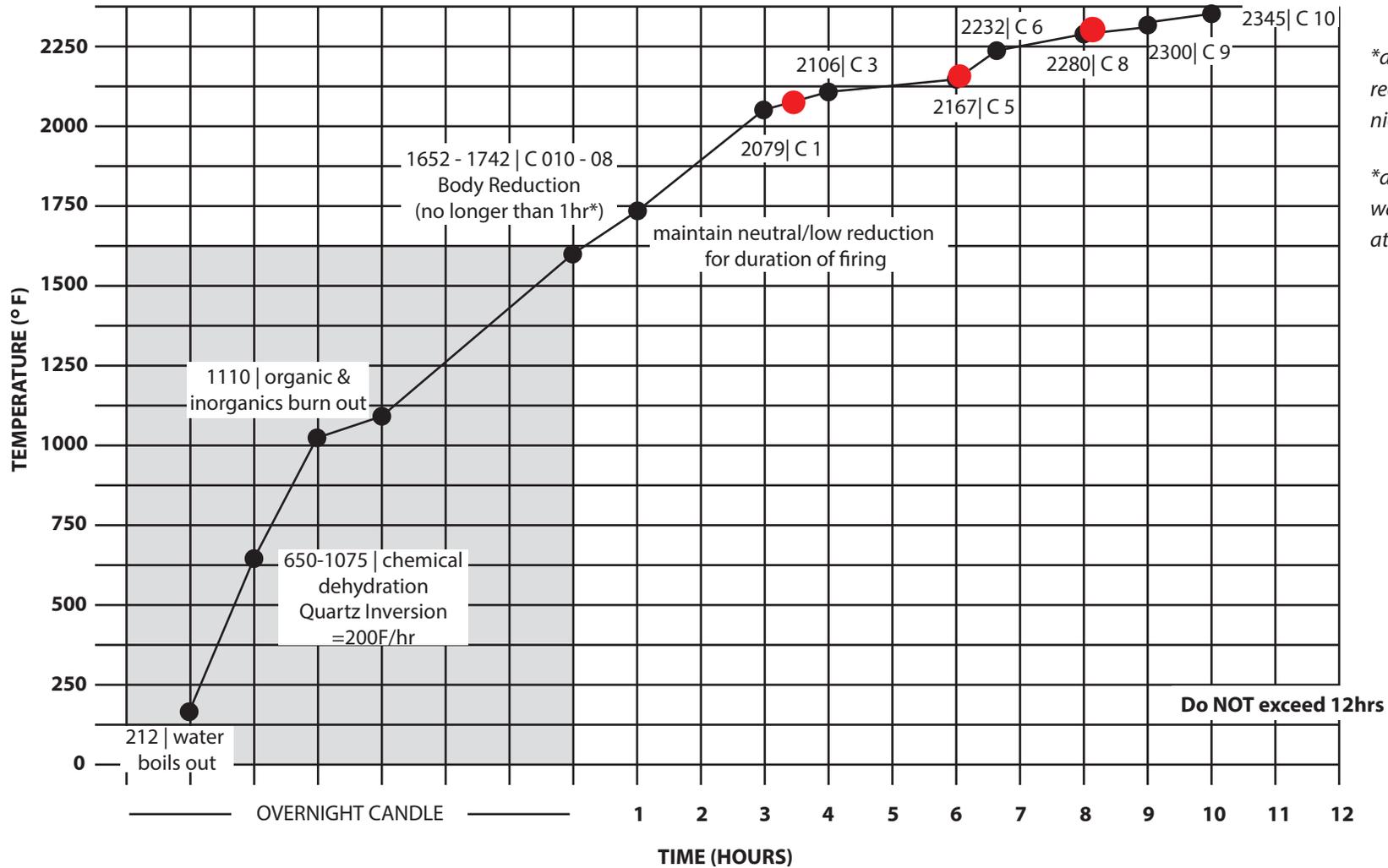
Coordinate firing with the lab monitors at night, sometimes they will shut the roll door and that creates an awful vacuum in the foundry.

You will need more than the pilots to pre-heat to cone010 by the next morning. Very low burners should do the trick.

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Firing Schedule: Cone 10 Reduction

based on Val Cushings C9 Rdx Firing Schedule



*at C9, give it a 30 min reduction soak for a nice glaze finish

*at C8, the kiln will slow way down pay attention to gas/air



potential stalling points, definitely need gas/air push here to keep the firing temperature moving along