



## Firing

A kiln is a thermally insulated chamber, a type of oven, which produces temperatures sufficient to complete some process, such as hardening, drying, or chemical changes. Kilns have been used for millennia to turn objects made from clay into pottery, tiles and bricks. A bisque fire generally runs for 12.5 hours and top temperature of 1945°F. A glaze fire runs for 7.5 hours and a top temperature of 1828°F.

### Safety

Tens of thousands of kilns are used safely in homes, schools, and professional studios throughout the world. With good understanding of the kiln and a little common sense you can avoid any accidents.

Please observe the following safety recommendations.

- The stainless-steel jacket and some of the other fixtures surrounding the kiln will get hot enough to burn your skin when the kiln is heated. Be extremely careful when working close to the kiln.
- Keep small children and pets from entering the kiln shed.
- Be careful when opening the kiln while the kiln is heated. We recommend you use fire rated gloves to protect your skin and make sure clothing is kept well away from any kiln opening or surfaces.
- The elements inside the kiln chamber will cause an electrical shock if touched. Never insert metal instruments or place any part of your body into the kiln while it is firing.
- The kiln controller is static sensitive. Touch kiln lid-handle before touching controller.
- Remove all potentially combustible materials from the kiln shed.
- Viewing inside the kiln chamber during firing can cause damage to your eyes. When necessary, use IR and UV protective glasses when looking into the kiln (#3 welder's green or gray glasses).
- Be cautious of intense heat around the peepholes when peep plugs are removed.
- In the event of a severe storm, unplug the kiln. Electrical surges can damage the controller circuit board.
- The kiln lids may be heavy. Make sure the lid brace is secure before releasing the lid.
- Do not place anything in the kiln you are uncertain about. Certain items may potentially melt, explode, or release toxic fumes. Items that may be damp (i.e., greenware) have the potential to crack or explode inside the kiln when the moisture trapped inside them turns to vapor when heated.
- For your safety, the protection of your kiln, and the protection of your ware inside the kiln, we recommend that you avoid unloading the kiln when it is above 125°F.

### Loading the Kiln

Kiln shelves have one side that is painted with kiln wash. *The painted side should be facing up*, with your wares sitting on it. Kiln wash is a sacrificial layer of material between your pot and your kiln shelves. Its primary purpose is to prevent glaze from sticking to the shelves. Take care when putting the shelves into or out of the kiln, so you do not hit the kiln side walls. The walls are very porous and chip and break easily.

Please watch these 2 videos on loading the kiln.

The Clay Process: Firing Clay in the Kiln (5:50 min): <https://www.youtube.com/watch?v=x7bIPvnZ24Q>

SKUTT: Loading Your KILN (2:39 min): <https://youtu.be/-HuhyFPa -Y>

**Unloading the Kiln.** Follow all safety recommendations. The kiln, shelves and your projects will be hot. Wear protective gloves and follow the operating instructions.

- Turn off the Envirovent fan before you open the kiln. The on/off switch is on the black electrical cord behind the kilns.
- Look at the controller. When completed, the display will show "CPLt" alternately with the firing time in hours and minutes and the current temperature inside the kiln.
- Avoid unloading the kiln when it is above 125°F. If you take wares out of the kiln a bit hot (above 150°F), you risk them developing cooling cracks from sudden change in temperature.



## Kiln Firing Guidelines

- Wear protective gloves. Remove items slowly and carefully.
- Remove shelves by lifting straight up.
- Take care when lifting ware on stilts as stilts may stick to the bottom of ware, then fall off suddenly and drop onto your other wares in the kiln. Return stilts to their designated bucket, by size
- Close the kiln lid before you leave to prevent dust from settling inside.

## Frequently Asked Questions

### *Do I need to put the stilts with the prongs pointed up or down?*

Prongs should always be pointed up, towards the ceiling. You only need stilts for glazeware, and you must put them under your piece with the prongs pointing up and touching your ware. This supports the glazeware, so the glaze doesn't touch the kiln shelf.

### *How far apart should I put the pieces on the shelf?*

Greenware can touch each other and can be delicately stacked on top of each other. Depending upon the shape of a project, a lot of greenware can fit into the kiln so it's a good opportunity to fire with another classroom. Glazeware cannot touch other pieces and needs about a half an inch between each piece.

### *What is the thermocouple?*

The thermocouple is the small stick that protrudes from the inside wall of the kiln. It regulates the temperature within the kiln. Leave at least a 2-inch clearance around the thermocouple.

### *Can you fire a piece more than once?*

Yes! If you did not get the piece wet, you can apply more glaze to the area you didn't like and re-fire your piece using the same setting. It's recommended to spray your ware with cheap hairspray for better adherence of glaze. Re-fire your piece with another classroom's projects.

### *Why did my project explode?*

Projects explode because they not completely dry. This happens because it was too thick or humid to allow the wares to dry thoroughly. Please use the Shop Vac to vacuum up all debris inside the kiln.

### *Can I label my projects with a sharpie or pencil?*

Yes, but it will burn off in the kiln. Instead, have students carve their name on the back with a dull pencil. Or you could write their name in glaze with a tip-writer. We strongly recommend that volunteers carve the child's name when working with younger classes to assure they are readable.

### *What can I do to repair broken greenware?*

Broken pieces can be repaired but usually it's best to do it after the final firing. Once they are bisqueware, you can choose which repair method works best. We recommend two types of glue, E6000 Clear or two-part epoxy, JB Weld Clear. Both are widely available at hardware and craft stores and in our PTA closet.

*The first option:* Keep the broken bisque pieces together. Glaze them as usual, except instruct the child to not glaze surfaces that will touch each other. After they're glaze fired, glue them back together.

*The second option:* If the broken piece sits directly on top of a flat base piece, where gravity will assist in melding the two pieces together, you can glaze both pieces, position the pieces carefully in the in the kiln and allow the glaze fire to meld the two together. However, if the broken pieces are side by side, or on an uneven surface, glaze melts (think candle wax) and drips during firing. You risk the broken pieces sliding off each other and welding in awkward positions or to the kiln shelf or a nearby ware.



## Kiln Firing Guidelines

### Kilns Information and Support

<b>SKUTT Kilns</b>	<b>KILN 1-1227</b>	<b>KILN 2-1222</b>
Model	KM-1227	KMT-1222
Volts	208 volts	208 volts
Amps	48 amps	48 amps
Phase	1 phase	1 phase
Max Temperature	2185° F	2300° F
Max Cone Fire	Cone 5	Cone 8
Purchase Date	Feb. 9, 2013	Jun. 9, 2022
Serial Number	005760	22E16-423
New kiln shed, August 2021		
New enviro-vent fan, Feb. 2020		

**Alpha Fired Arts**, Josh Tanner, Manager: (916) 484-4424. Tues-Saturday, 10:00 AM-4:00 PM

**Skutt Technical Support:** (503) 774-6000. Mon.-Friday, 7:00 AM-4:00 PM Pacific time

#### **Problems or Questions?**

If you have questions, concerns, problems, or suggestions, feel free to contact us. If you need immediate assistance, please call Diane or Maddy.

Maddy Harvey (916) 802-7366 and Diane Evans (916) 990-6415

Program Coordinators at [FHECeramicArts@gmail.com](mailto:FHECeramicArts@gmail.com)



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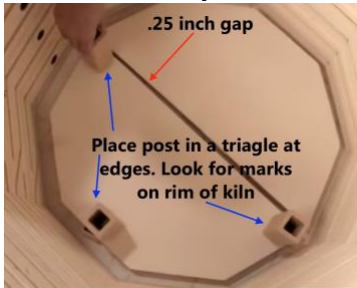
## Kiln Firing Guidelines

### Firing Greenware / Bisque Fire

#### START HERE

Wares can touch each other, can be lightly stacked, and can sit directly on the kiln shelves.

1. Turn on the Envirovent fan before you start the kiln, turn it off before you unload. **The on/off switch is on the black electrical cord on the wall behind and between the 2 kilns.**
2. Place kiln posts on shelf in a triangle shape on the outer edges, using 3 on each half-shelf. Load your wares. When adding posts for a 2nd shelf, place them on top of the posts below.
3. Place the shelves. Assure the kiln-washed side of shelf – the white side - is facing upward; leave a 1-inch clearance from the walls of the kiln, ¼ inch clearance in the middle between the 2 half-shelves and a 2-inch clearance from tallest piece to the kiln lid.
4. Be sure the shelf nearest the thermocouple and all project pieces are at least 2 inches away from the thermocouple (it's the black tip protruding from the kiln sidewall).
5. If you do not have a full load, it is best to fire your wares in the middle and top of the kiln.
6. When done loading, carefully lower the kiln lid and secure the latch.
7. A green fire (bisque fire) runs for 12.5 hours, then needs about 14 hours to cool.
8. **Start the Kiln by 9:00 AM and Unload the Kiln the Next Day after 2:00 PM.**



Green fires take longer to fire than glaze fires. Because of this, the kiln that was used for a green fire, cannot be used the following day. It will be too hot to unload the next day until afternoon, around 2:00 PM.

#### Program the Controller for a Green Fire

##### Green Fire Kiln 1 – KM1227 (old kiln)

- Press “Enter” a few times. Display will flash “Stop or Idle” and the temperature inside the kiln.
- Press “Cone Fire”
- Press 04 and then Enter. The display will flash “Spd” Med or Slow.
- Press “Slow” firing speed, and then Enter.
- Display should flash “Hold” and “0.00.” Press Enter. If something other than “0.00” is flashing, press “0” and then press Enter.
- Verify the cone level is correct -> Press “Review” button. **Verify the cone is 04 and speed is slow.**
- The kiln should flash “Idle” or “Stop” -> Press “Start.”
- Listen for the controller to click a few times and look at the temperature to go up a few degrees within a few minutes.
- Turn the box fan on high and point it towards the red controller box on the kiln.

##### Green Fire Kiln 2 – KM1222 (new kiln)

- Press HOME
- Press BEGIN HERE
- Select PROGRAM
- Select MY PROGRAMS
- Select #1 CONE 04 SLOW
- Review info on screen to **verify the cone is Cone 04 and speed is slow.**
- Press START.
- Listen for controller to click a few times and look at the temperature to go up a few degrees within a few minutes.
- Turn the box fan on high and point it towards the red controller box on the kiln.



## Kiln Firing Guidelines

### Firing Glazeware / Glaze Fire

#### START HERE

Wares must be stilted, with the bottom of your piece touching the stilts (pointed side of stilt facing upward toward the ceiling). Glazeware must not touch other pieces or any part of the kiln. Leave ½ inch between your pieces.

1. Turn on the Envirovent fan before you start the kiln, turn it off before you unload. **The on/off switch is on the black electrical cord on the wall behind and between the 2 kilns.**
2. Place kiln posts on shelves in a triangle shape on the outer edges, using 3 on each half-shelf. When adding posts for a 2nd shelf, place them on top of the posts below.
3. Place the shelves. Assure the kiln-washed side of shelf – the white side - is facing upward; leave a 1-inch clearance from the walls of the kiln, ¼ inch clearance in the middle between the 2 half-shelves and a 2-inch clearance from tallest piece to the kiln lid.
4. Be sure the shelf nearest the thermocouple and all project pieces are at least 2 inches away from the thermocouple (it's the black tip protruding from the kiln sidewall).
5. If you do not have a full load, it is best to fire your wares in the middle and top of the kiln.
6. When done loading, carefully lower the kiln lid and secure the latch.
7. A glaze fire runs for 7.5 hours, then needs about 12 hours to cool.
8. **Start the Kiln by 9:00 AM and Unload the Kiln the Next Day by 8:00 AM.**

#### Program the Controller for Glaze Fire

##### Glaze Fire Kiln 1 – KM1227 (old kiln)

- Press “Enter” a few times. Display will flash “Stop or Idle”
- Press “Cone Fire”
- Press 06 and then Enter. The display will flash “Spd” Med or Slow.
- Press “Medium” firing speed, and then Enter.
- Display should flash “Hold” and “0.00.” Press Enter. If something other than “0.00” is flashing, press “0” and then press Enter.
- Verify cone level is correct by pressing “Review” button. **Verify cone is 06 and speed is medium.**
- The kiln should flash “Idle” or “Stop”
- Press “Start.”
- Listen for the controller to click a few times and look at the temperature to go up a few degrees within a few minutes.
- *Turn the box fan on high and point it towards the red controller box on the kiln.*

##### Glaze Fire Kiln 2 – KM1222 (new kiln)

- Press HOME
- Press BEGIN HERE
- Select PROGRAM
- Select GUIDED START
- Select CERAMICS
- Select GLAZE
- Select CONE 06 SLOW
- Select MEDIUM speed, then press NEXT
- **Verify that cone is 06 and speed is medium.**
- Select START
- Listen for controller to click a few times and look at the temperature to go up a few degrees within a few minutes.
- *Turn the box fan on high and point it towards the red controller box on the kiln.*