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. Use IR and UV protective glasses when looking into the kiln. #3 welder's green or gray glasses will protect your eyes.
- 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 125ºF.

Loading and Unloading 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. When unloading, follow all safety recommendations. The kiln, shelves and your projects will be hot. Wear protective gloves and follow the operating instructions.

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

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 of space between each piece.

What is the thermocouple?

The thermocouple is the small stick that protrudes from the inside wall of the kiln. It controls and regulates the temperature within the kiln. If broken, the kiln will not heat properly.

Can you fire a piece more than once?

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

Is the kiln insulated?

The kiln is not insulated and is very hot to the touch when it is running. Please be careful and use gloves to unload and when touching shelves and posts.

Why did my project explode?

Projects explode because they were either not completely dry, because it was too thick or because there was no vent hole to allow steam to escape. Please use the Shop Vac to vacuum up all debris inside the kiln.

Can I label my projects with a sharpie or pencil?

No, it will not survive the extreme heat of firing. Have the student carve his/her name on the back with a cutting tool. Or write their name in glaze with a tip-writer. We strongly recommend that volunteers carve the child's name when working with younger classes. Often, the name can be hard to read after it is glazed so make sure it's legible.

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 JB Weld Clear Weld Syringe. Both are widely available at hardware and craft stores. *The first option:* Keep the broken bisque pieces together. Glaze them as usual, except instruct the child to keep the glaze off the broken surfaces. 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 to the kiln shelf or a nearby ware.

KILN Operating Instructions

Greenware pieces can touch each other, can be lightly stacked, and can sit directly on the kiln shelves. **Glazeware pieces 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 pieces.

Start the Kiln by 9:00 AM and Unload the Kiln the Next Day by 8:00 AM

1. ***Turn on the Envirovent fan***. The on/off switch is on the black electrical cord hanging on the wall behind and between the 2 kilns.
2. The bottom of the kiln is always covered by a shelf sitting 1 or 2 inches above the bottom.
3. Put kiln shelf posts on shelves in a triangle shape, using 3 on each half-shelf. Load your wares. As you stack additional posts/shelves, put them directly on top of the posts below.
4. Place the shelves, leaving 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.
5. Assure the kiln-washed side of shelf is facing upward.
6. 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).
7. If you do not have a full load, it is best to fire your wares in the middle and top of the kiln.
8. Carefully lower the kiln lid and secure the latch. The kiln generally runs for 12.5 hours when running a bisque fire and about 7.5 hours during a glazeware fire.

PROGRAM KILN 1 – KM1227 On the controller…

- Press "Enter" a couple of time until display flashes "Stop or Idle"
- Press "Cone Fire"
  - When firing Greenware, press 04 and then Enter. The display will flash "Spd" Med or Slow. Press "Slow" firing speed, and then Enter."
  - When firing Glazeware, 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 "Enter."
- Verify the cone level is correct: on the controller, press the 'Review' button. Verify the cone and speed matches what you want.
- The kiln should be flashing "Idle or Stop." Then press "Start."
- Verify the kiln started: You will hear the controller click a few times and the temperature displayed will go up a few degrees within 2 minutes or so.

PROGRAM KILN 2 - KMT1222 On the controller…

- Press "Begin here" -> Program -> Guided Start -> Ceramics
  - When firing Greenware, choose Bisque -> Preheat? -> No -> Cone 04 -> Slow speed
    Select "Next" to review and start the kiln. Listen for controller to click and temperature will go up a few degrees within two minutes or so.
  - When firing Glazeware, choose Glaze -> Cone 06 -> Medium speed.
    Select "Next" to review and start. Listen for controller to click and temperature will go up a few degrees within two minutes or so.

When unloading the kiln:

- 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 125ºF.
- 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
- 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.
- Close the kiln lid before you leave.

Our Kiln Information: SKUTT Kilns

ITEM	KILN 1-1227	KILN 2-1222
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