



Kiln Management Guide for Schools

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An organized approach to kiln management can save school districts money, improve safety, and provide Art Coordinators with the tools necessary to run an efficient ceramics program. This guide covers the entire lifecycle of a kiln, from room design to maintenance, firing, and eventual retirement. It is intended as a reference; adjust recommendations to fit your school's unique environment.

This document is not meant to cover every issue but serves as a guide towards the everyday management of the kiln. For more information, or if you have any questions, contact our Technical Support Team at CustomerCare@amaco.com.

Key Topics Covered

1. Designing the Kiln Room
2. Equipment Procurement and Bids
3. Training, Maintenance, Repairs, and Safety
4. Kiln Maintenance
5. Safety Guidelines
6. Firing Procedures



Designing the Kiln Room

A well-planned kiln room ensures safety, efficiency, and longevity of equipment. Whether designing a new space or retrofitting an existing room, consider these core elements:

Location

- Adjacent to the art classroom for easy transfer of projects and kiln monitoring.
- Secure the room to prevent unauthorized access. Use locks, barriers, and warning signs.
- For outbuildings, ensure the space is secure to prevent unauthorized access and protected from rain, humidity, and extreme temperatures ($>100^{\circ}\text{F}$). Floors should be level, and carts should be able to roll around the kiln for loading. The Uniform Mechanical Code requires the kiln to be placed on 2" of solid masonry.

Ventilation & HVAC

- Work with HVAC contractors to account for kiln BTU output and prevent overheating.
- Kilns automatically shut off if room temperature exceeds 100°F to protect electronics.
- The HVAC system in the school should be independent of the school's ventilation system. If not, strict firing procedures must be followed with regards to the hours the kilns may be fired, especially if the school's ventilation system is designed to shut down during certain hours to save energy.
- Provide make-up air to replace ventilated air. Avoid bringing hot air from unconditioned spaces.
- Ensure HVAC operation is independent of energy-saving shutdown schedules during firing.



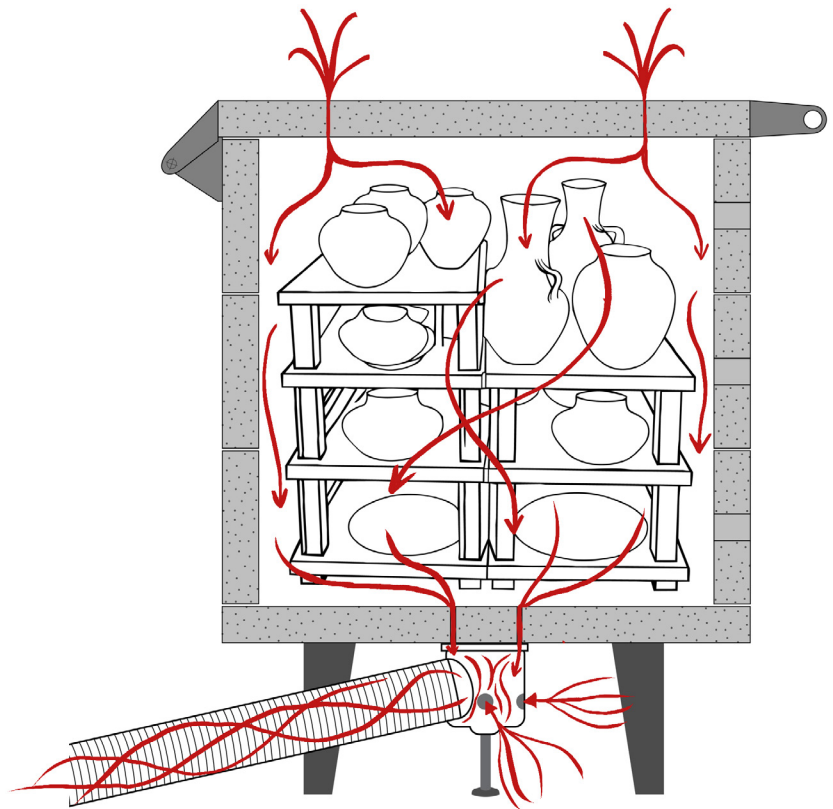
Fire Suppression

- Heat sensors and sprinklers may need adjustment for the kiln environment.
- Keep kilns at least 10 feet away from sprinkler heads.
- Verify local codes and work with your facilities manager for compliance.

Max. Ceiling Temp		Head Rating		Classification	Solder Link Color	Glass Bulb Color
F	C	F	C			
100	38	100-170	57-77	Ordinary	Uncolored or Black	Orange or Red
150	66	175-225	70-107	Intermediate	White	Yellow or Green
225	107	250-300	121-149	High	Blue	Blue
300	149	325-375	163-191	Extra High	Red	Purple
375	191	400-475	204-246	Very Extra High	Green	Black
475	246	500-575	260-302	Ultra High	Orange	Black
625	329	650	343	Ultra High	Orange	Black

Kiln Ventilation

- Locate kilns near exterior walls when possible for venting.
- A kiln vent provides a variety of benefits:
 - **Removes Fumes:**
Removing the fumes can help prevent damage to the elements
 - **Truer Colors:**
A KilnVent draws in room air to add oxygen needed for reds, greens, golds,



and yellows. Colors are brighter, more vibrant, and can be fired together.

- **Safer Work Area:** Unvented kilns exceed OSHA levels for carbon monoxide within the kiln room. A KilnVent mixes hot gas from the kiln with room air to safely vent outdoors a now cooled exhaust.
- **More Uniform Temperatures:** The KilnVent circulates hot gasses in the kiln so items at the bottom or top of the kiln receive the same heat.
- **Fewer Firing Problems:** Oxygen brought into kilns helps burn out carbon and organics in bodies and glazes reducing crazing, pinholing, and porcelain mildew.

Electrical & Power Requirements

- Match kiln voltage and phase to your buildings' specifications. This can be confirmed with meter checks, reaching out to the school's facilities team, or through a certified electrician.
 - Kilns are designed specifically to run on 208V or 240V.
- Install appropriate receptacles (consider plug orientation and height).
 - The receptacle should be located on the wall behind the kiln on the right-hand side, 12" to 18" from the floor to ensure the plug will reach, and the floor will not cause the cord to put upward pressure on the plug. The receptacle should be placed with the ground on top.
- Ensure circuit breakers are rated to 125% of the kiln's amperage and are properly rated for safety.
- Direct-wired kilns require visible, non-fused shut-off switches for emergency access.



Equipment Procurement and Bids

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Planning

- Engage early with architects and contractors to ensure modern kiln specifications are used.
- Ensure that whoever wins the bid orders the correct voltage and phase kiln model. It's best to test the outlet with a meter and inspect the wire gauge and breaker to ensure it suits the new kiln.
- Contact your local distributor, as they often provide services beyond contractors, including training and proper installation.

Services to Include in Bids

- Freight damage inspection
- Inside delivery and setup
- Installation testing
- Teacher training

Installation & Inspection

- Ensure a qualified kiln professional oversees delivery, setup, and final inspection.
- Verify voltage, amperage, thermocouple function, vent operation, and accessibility of controls.
- **Voltage Check** – Does the voltage match the designated rating on the kiln's serial plate?
- **Voltage Under Load** – Does the voltage drop significantly when the power is turned on? This situation will not only affect the performance of the kiln but can indicate a potential fire hazard.
- **Amperage** – This test can indicate if something became loose or was damaged during shipping or installation. Do all of the readings match the manufacturers specifications?
- **Thermocouple** – Does the display indicate that the kiln is rising in temperature?
- **KilnVent Function Test** – Is it working properly?
- **Is there any damage to the kiln that the contractor would be responsible for?**

Essential Equipment



Kiln (stand, pyrometric cones, and peep plugs)



Downdraft vent system



Kiln furniture (shelves, kiln wash, posts)



Training, Maintenance, Repairs, and Safety

Proper training ensures safety, maximizes kiln lifespan, and prevents project damage. All teachers must be trained before firing kilns. Training ensures safety, protects property, and guarantees quality results. Components include:

- Ceramic program safety
- Firing guidelines
- General ceramics education
- Kiln operation and safety
- Periodic updates and verification of completion

Training resources can include manuals, videos, supplier sessions, and state/national art education classes.

- **Teacher Management:** Coordinators review firing history for performance evaluations.
- **Kiln Management:** Reallocate underused kilns to new schools, saving money.
- **Maintenance:** Technical support remotely diagnoses kilns, allowing fast part replacement and repairs.

Teacher Responsibilities

- Understand manual and safe operation procedures.
- Follow proper kiln loading, programming, and venting protocols.
- Know who to contact for maintenance or error codes.

Authorized Personnel

- Only trained staff should operate, load, and fire kilns. Access to the kiln room should be limited to teachers and supervisors.
- Unauthorized use can cause safety hazards, equipment damage, or unnecessary fire suppression activation.

Training Options

- **Local Distributor Training:** Reach out to your local distributor to see what training opportunities are available for your classroom.
- **Online Resources:** AMACO Create provides videos, manuals, and guides to supplement in-person training. Reference our [YouTube Kiln Training Series](#) for support.

AMACO does not certify technicians for kiln maintenance. We recommend connecting with your local distributor or supplier to connect with a qualified kiln repair technician.



Kiln Maintenance

A planned maintenance program prolongs kiln life, reduces downtime, and improves safety.

Inspections

- Perform yearly inspections by trained technicians or factory-trained distributors.
- Check thermocouples, elements, relays, and kiln structure.
 - When inspecting your kiln, ensure there is no debris on the kiln floor, and gently vacuum your kiln after every firing. Verify that all elements remain properly seated in the brick grooves and that the soft brick is not damaged. Regularly check and tighten the kiln bands as needed. If you encounter any error messages, refer to your kiln manual for guidance.
- Log results and schedule repairs promptly.
- Eventually, it may make financial sense to purchase a new kiln vs. continue with repairs. Create a list of criteria in order to know when best to retire a kiln and save money in the long term.

Common Repairs:

Component	Life Expectancy	Notes
Thermocouples	40–150 firings	Replace in-house if trained
Elements	800–1200 firings	Replace with technician
Relays	~100 firings	Replace all at once
Bricks	As needed	Schedule with element replacement

See amaco.com for more information on the cost of components.

Maintenance

Teacher:

- Vacuum kilns regularly to prevent dust buildup.
- Protect the thermocouple against static discharge coming from the vacuum hose.
- Keep lids closed when not in use.

Facilities Staff:

Train staff to replace thermocouples and other basic components safely.

Warranty Repairs:

Contact CustomerCare@amaco.com for more info.

Retiring a Kiln:

- Kilns typically last 10–15 years.
- Retirement is recommended when major components (bricks, elements, controller) require costly replacement.



Kiln Firing Log

Select Fire

Date: _____

Program #: _____

Start Time: _____

PROGRAM

Rate						
Temp						
Hold						

Project Description: _____

Date: _____

Program #: _____

Start Time: _____

PROGRAM

Rate						
Temp						
Hold						

Project Description: _____

Date: _____

Program #: _____

Start Time: _____

PROGRAM

Rate						
Temp						
Hold						

Project Description: _____



Safety Guidelines

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Avoiding Burns

- Wait until the kiln has completely cooled before unloading to prevent burns.
- Kiln exteriors can reach 460°F.
- Limit access using locked doors, screens, and signage.
- Maintain clear pathways and remove trip hazards.
- Locate items that may need access while the kiln is firing away from the kiln to prevent coming too close to a hot kiln.

Lid Safety

- Ensure lid hardware is secure.
- Use lid lifters to prevent strain and injury.
- Match kiln size to teacher height; smaller kilns are safer for shorter staff.



EZ-Lift Upgrade Kits

Fumes

- Vent all kilns to prevent harmful or unpleasant emissions.

Room Temperature & Smoke

- Kiln room temperature above 100°F (or below 32 °F) can trigger automatic shutdown.
- Ensure HVAC is adequate and operating during firings.
- Avoid combustibles in the kiln that could produce smoke.



Firing Procedures

Permissions & Access

- Only trained, authorized personnel should operate kilns.
- Maintain clear rules for who may enter the kiln room, fire kilns, or perform maintenance.

Firing Modes

- **ConeFire Mode:** Standard program for most ceramic projects.
- **Ramp/Hold Mode:** Advanced projects requiring custom firing.

Material Considerations

- The recommended bisque-fire temperature is Cone 04. However, pay close attention to the firing temperatures of your clay and glazes. If you use materials with varying firing ranges, it is recommended to separate them during the glaze firing to ensure optimal results. For example, low-fire clay may only be rated to Cone 04 and can melt if fired to a higher temperature.
- Set kiln controller MAX temperatures to prevent accidental overfiring.

Loading Guidelines

- Patch bare spots on shelves with kiln wash
- Ensure lid brace is secure.
- Distribute mass evenly.
- Make sure on a glaze firing that glaze is not touching the shelf or applied in a way that would cause it to drip onto the shelf.
- Maintain clearances: 1–2" from elements, thermocouple, and shelves.
- Remove flammable materials.



Preheat & Bisque Fire

- Preheat large/thick pieces to prevent cracking.
 - For steps on how to preheat your kiln, refer to your manual, or check out our video on [Programming a Kiln for Beginners](#).
- Greenware should be completely bone dry before placing it in the kiln. You can test moisture levels by holding each piece to your cheek; if the clay feels cool, it still contains moisture and should be allowed additional time to air dry.
 - Important to note: Greenware will always contain moisture equal to the surrounding atmospheric humidity; if humidity increases, so does the moisture in the greenware.
- Bisque fire to cone 04–05 for low and high fire clays. A slow firing is recommended to ensure all of the carbon is burned out of the clay and does not gas out during the glaze firing causing pinholes.
- Use Delay Start to schedule firing outside of staff hours. (Refer to your code of conduct if your school allows for this.)

Bisque Firing – Slow Speed

Bone-dry pieces under 1/2" thick or 12" in size may be fired on Slow Speed, which are designed to keep cracking to a minimum. If the kiln operator feels that some items may be at risk, additional preheating may be added to prevent cracking of bisque ware.

Glaze Firing – Medium Speed

- Low Fire: ~7 hours | Mid-Fire: ~8 hours
- Fire to the cone rating on the packaging. Low Fire glazes should be fired 2 cones higher than bisque (e.g., Bisque 04 to Glaze 06).
- Avoid glaze on shelves; leave 3/16" from the base. Ensure pieces do not touch.

Before Firing

- Insert Peep Plugs; close lid if using Down Draft vent. Otherwise, leave top Peep Plug out.
- Remove flammable materials; ensure the power cord is clear.
- Confirm the ventilation system is active for full firing.
- Display warning signs; consult facilities for door/airflow requirements.

After Firing

- For the safety of yourself and the pieces in your kiln, we recommend waiting to open the kiln until the temperature is 125°F or cooler.
- It is important to keep a log of your firings. If the kiln is taking longer to complete a firing, the kiln elements may need to be replaced.

