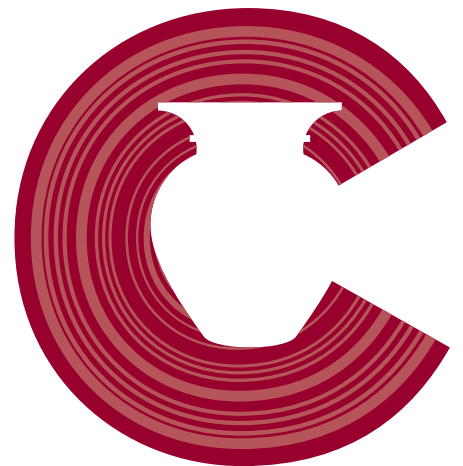


zfire

kiln Series

Kiln Info



THE
ceramic
SHOP

SAFETY NOTICE

1. All recommended cautions and requirements are meant to assist Users to properly and safely operate their kilns. Many of these cautions apply to kilns and ceramic processes in general.
2. By making use of these instructions, User acknowledges that process and manufacturing systems improperly installed, maintained, or operated can pose serious and dangerous threats to worker safety, environmental integrity, and product/process quality.
3. Kilns operate at high temperatures and make us of high voltages/amperages and if improperly installed, maintained, or used can cause serious personal or property damages.
4. Commercial kilns are provided with various safety, performance, and operating limits, designs and devices which, if disconnected, altered, tampered with, or changed by User, User's employees, User's agents, or others acting on User's behalf or with User's knowledge, will become User's sole risk and responsibility.
5. User also has the sole responsibility for assigning properly trained persons to operate the kilns who have demonstrated common sense and a general aptitude for such work.
6. It is User's sole responsibility to understand and assure adherence to all safety notices and installation, operating, and maintenance instructions provided by this web site and/or by the kiln manufacturer.

QUESTIONS?

Call The Ceramic Shop.

INSTALLATION CAUTIONS

USE A QUALIFIED ELECTRICIAN

1. Have electrical installation performed by a licensed electrician or other qualified technician.
2. There is danger of electric shock.
3. There is danger that an improperly sized or installed circuit could cause a fire.

CLEARANCES AND FLAMMABLE SURFACES

1. Make certain floor is not flammable.
2. Install kiln so that the hot surface of the kiln is no closer than 12" (30 cm) to any wall. 18" (46 cm) is preferable.
3. Be careful about enclosed spaces: In general, it is not a good idea to install a kiln in a small confined space (such as a closet).
4. Maintain a minimum of 36" (91 cm) between the hot surfaces of two adjacent kilns, especially if they are going to be used at the same time. (The kilns will heat each other).
5. The essential issue with kiln clearance is to keep excessive heat from flammable surfaces. Remember, even when you follow clearance and ventilation recommendations, the kiln is giving off heat. Try not to locate it near things that can be affected by elevated temperatures. An example of this would be an electrical fuse panel, which you do not want to overheat.

CHECK TEMPERATURES AROUND KILN

1. Check temperatures around the kiln when it is at high fire to be sure that you are not creating an unsafe condition.
2. Combustible surfaces that stay below 71°C (160°F) are generally considered safe from the point of view of starting a fire.

LEVELING THE KILN

1. Level the kiln while you are installing it.
2. Use thin metal shims under the legs to accomplish the leveling (never wood or other combustible materials).
3. Make sure that the base will not wobble.
4. Leveling is important because the kiln sitter (in manual kilns) is affected by gravity. If the kiln is not properly leveled the kiln sitter might be either too reactive or too sluggish.

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5. You do not want your ware to be unstable in the kiln.
6. If kiln is not leveled this could lead to the cracking of the bottom and the top. In particular, the bottom could easily crack when you first set the weight of the kiln on the bottom while setting up the kiln for the first time.

THERMOCOUPLES

1. Thermocouples must be inserted into the kiln at least 1" (2.5 cm) in from the inside surface of the kiln.
2. They must protrude into the kiln itself because if the measuring tip of the thermocouple is buried inside the insulation the thermocouple will measure a lower temperature than the actual temperature in the kiln.
3. This could cause an overfire of the kiln.
4. Replace thermocouples once they are no longer reasonably accurate.

USE THE SUPPLIED KILN STAND

1. Do not use kiln without the supplied stand.
2. Never set a kiln on a floor without significant air space circulating under the kiln.
3. Stands typically raise the floor of the kiln by 8" (20 cm).

DON'T USE AN EXTENSION CORD

1. Never use an extension cord with your kiln.
2. Locate the outlet close enough to the kiln to plug directly into it with the kiln's supplied power cord.

POWER CORD MUST BE PROPERLY RATED

1. Kiln power cords are rated for 105°C (221°F).
2. Anything less than this can cause a malfunction and possible fire where the power leads connect to the control box.
3. It is OK, and will not void the warranty, to remove the plug that comes with the kiln and direct wire the kiln. However, the connection wires must be rated for a minimum of 105°C (221°F).

USE COPPER WIRE FOR HOOK UP

1. Do not use aluminum wire on the final connection to the kiln.
2. The specific reason particular to kilns is that the wire tends to get hotter near the kiln than it might going into some other types of appliance.
3. Being a resistive load, there is constant heat being generated by the conductors for quite a few hours. When aluminum wire gets hot it accelerates oxidation. Aluminum oxide is a resistor; copper oxide is not as much. If the connection at the terminal board gets oxidized it will really heat up - to the point where it could cause a fire.
4. Note: Depending on local codes it may be OK to use aluminum wire to your subpanel - as long as that wire is not exceeding its temperature rating while kiln is firing on full power for an extended period of time.

PROTECT POWER CORD FROM KILN CASE

1. Rout Power Cord (or electrical connection wires) away from kiln in such a way that it can not touch the hot case of the kiln.
2. Secure it so it cannot move.
3. If cord touches the hot case it could melt and cause a short circuit and/or fire.

KEEP KILN DRY & IN PROTECTED SPACE

1. The kiln must be kept dry.
2. It is best to keep it in an enclosed room away from inclement weather. See specific details in the INSTALLATION INSTRUCTION section.
3. Note that our warranty does not cover damage from corrosion and electrical damage caused by inclement weather.
4. Water in contact with a kiln can cause an electrocution hazard.
5. If you keep a kiln outside (even in a very dry environment) and cover it with a tarp to protect it from rain you could still cause corrosion from the dew that forms on the cold metal surface of the kiln in the morning.

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KEEP A FIRE EXTINGUISHER NEAR KILN

1. Keep an adequate fire extinguisher near the kiln and check it on a regular basis.
2. You may want to check with your local fire authorities to see if there are any specific requirements they have such as sprinkler systems, automatic foam extinguishers, etc.
3. Use a fire extinguisher that is rated for electrical fires (we recommend ABC rating).

SPRINKLER CAUTIONS

1. If you have a sprinkler system be careful to check the temperature rating and location of the heads so that you do not inadvertently cause them to actuate under normal firing conditions.
2. Be sure to monitor this while the kiln is at its highest firing temperature and conditions are at their worse (for instance when the door to the kiln room is closed or the ventilation fan is turned off). Serious damage to the kiln and your premises can take place if the sprinkler system goes off when the kiln is at high temperature - especially if no one is in building when it happens.

GENERAL ENVIRONMENT CAUTIONS

VENTILATION IS ESSENTIAL

1. Kilns generate harmful fumes when firing ceramics.
2. Fumes include carbon monoxide, sulfur oxides, hydrogen fluoride and metal vapors (all of which can be very toxic).
3. Install kiln in well-ventilated area.
4. Never operate in an enclosed space such as a closet unless you have good ventilation.
5. Aside from issues of ventilating the fumes from the firing, the heat build up in an enclosed room could present a significant fire hazard. See the INSTALLATION cautions.
6. Severe corrosion can be caused by kiln fumes, salt air or other environmental conditions.
7. Good venting can minimize these problems.
8. Ventilation must be to the outside.
9. Be careful not to locate the outlet of the vent near an open window.

AMBIENT TEMPERATURES

1. The kiln should operate in an environment that is between -18°C (0°F) and 38°C (100°F).
2. Note that the control, if set up for degrees centigrade, may give you an error code if room temperature drops below 0°C (32°F). The control does not handle negative numbers.

SURFACE IS HOT AND CAN CAUSE BURNS

1. Kiln surface can be extremely hot: up to 260°C (500°F).
2. You can be severely burned if you touch the hot surface.
3. Display a sign near the kiln that specifically warns everyone of how hot the kiln is.

KEEP CHILDREN & ANIMALS AWAY FROM KILN

1. Protect any children, animals, and unqualified adults (anyone who is not able to understand these cautions) that may be near the kiln.
2. Aside from fumes that must be ventilated, and flammability concerns, they must be protected from the heat of the kiln and the electrical dangers.
3. Ideally, the kiln should be secured in a space away from any children (especially in a schoolroom situation where children might not always follow safety precautions).

KEEP FLAMMABLES AWAY FROM KILN

1. Do not put sealed containers or combustible materials such as solvents, paper, rags, in or near kiln.
2. An explosion or fire could result.

PRACTICE GOOD HYGIENE

1. Clay contains silica dust, which can be harmful (see silica caution) and that many glazes contain heavy metals such as lead, cadmium and copper.
2. While this caution is outside the scope of kiln safety it is worth mentioning here.

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3. Keep your room clean and your kiln clean.

TRIPPING HAZARDS

1. Be sure to remove tripping hazards near the kiln.
2. In particular be sure to keep the kiln cord out of traffic areas.

CLOTHING TO AVOID

1. When working around a hot kiln be careful of the kinds of clothes you are wearing.
2. Some clothes could potentially catch on fire if they touch the hot surface of a kiln.
3. Also avoid loose fitting clothes that could catch on the kiln.

PROPER USE OF KILN WASH

1. Make sure the floor of the kiln and the tops of the shelves are coated with kiln wash.
2. This will protect these surfaces from melting glaze and ceramics.
3. Do not coat the undersides or sides of the shelves.
4. Do not apply kiln wash to the brick sides or element grooves. (Damage to the elements could result).
5. Clean off the old wash and reapply new wash each time you fire or when it begins to chip away.

PREFIRING CAUTIONS

KILN WASH CONTAINS SILICA

1. Long-term exposure to silica dust could cause lung damage.
2. See the MSDS sheets, which are available from us.
3. Exercise proper caution when mixing the dry powder and when removing it from your shelves.
4. Use a NIOSH approved particulate respirator for dust and use proper ventilation. You can buy these from safety supply houses. (NIOSH_approval #TC-21C-132 is an example).

DO NOT USE SILICA SAND

1. Do not use silica sand in the kiln.
2. Some people like to use this as a work support medium.
3. The silica sand will attack the elements and thermocouples.
4. It can migrate in the kiln from expansion and movement due to heat.
5. If you must use sand to support or stabilize your load try alumina oxide or zirconia oxide sand.

NEVER FIRE MOIST GREENWARE

1. Never load moist greenware or pots in your kiln.
2. The expanding water vapor in the ware could cause the ware to explode, damaging your kiln interior.
3. Remember that there may be water trapped in the work even if you can't always see it. If you place a piece of greenware next to your wrist and it feels cool to the touch it probably has too much moisture in it to fire.

CAUTION WITH USE OF WAX

1. When you heat wax (in wax resist and lost wax processes) it will volatilize and potentially condense in the cooler ventilation ducts.
2. Over time this can cause a fire hazard because the wax is flammable.
3. Depending on how the vent motor is mounted, the wax can also gum up the vent motor.
4. If you use these processes it is entirely up to you to engineer and monitor the safety of the installation.
5. The use of wax will void the warranty of the vent system.

DO NOT FIRE TEMPERED GLASS

1. Tempered glass can explode when fired.

STORE SHELVES IN A DRY LOCATION

1. Shelves can absorb moisture.
2. This can cause them to explode when fired.

DO NOT USE CRACKED SHELVES

1. Cracked shelves can fail in the middle of a firing causing the whole load in your kiln to collapse.

DO NOT FIRE TOXIC, FLAMMABLE, OR UNKNOWN MATERIALS

2. Plastics, organic materials, bakeable modeling clay, mothballs and a large variety of materials can decompose under heat causing the release of highly toxic fumes or rapid uncontrollable combustion.
3. Rocks, marbles, cement and other materials may explode under high temperatures.
4. Before firing anything but ceramics, glass and metal (obtained from a known reputable source) in a kiln carefully investigate what happens under heat.
5. This is the sole responsibility of the user.
6. The kiln is not designed to be used for firing hazardous materials.

LOADING & UNLOADING CAUTIONS

TURN OFF POWER WHILE LOADING

1. Turn off power to the kiln when loading or servicing.
2. If power is on when you are loading or unloading the kiln it is possible to touch the elements and get electrocuted.
3. We recommend having the kiln attached to a fused disconnect switch with a lockout device (in any institutional or industrial installations where someone could turn on the kiln while someone else was working on it).

KEEP LID CLOSED WHEN KILN IS NOT IN USE

1. Keep lid closed when not operating the kiln.
2. Otherwise the weight of the lid over time may force the hinge and stainless wrap to move down.
3. This will affect the way the lid closes and may cause the lid to crack.
4. It will also keep the kiln cleaner by keeping dust out.
5. In addition, if the kiln somehow gets turned on accidentally, an open kiln could present a fire hazard.

DO NOT STORE ANYTHING ON LID

1. Do not use the lid as a storage shelf.
2. The lid could crack.
3. Also - this practice could lead to a fire if you accidentally leave combustible materials on the lid.

DO NOT OPEN THE DOOR ABOVE 250°F

1. Do not open the kiln door until the kiln has cooled down to 250°F (120°C).
2. You could burn your hand on the handle and/or the radiant heat from the kiln.
3. Be careful when you do open the door at this temperature because you can still get burned.
4. Use heat resistant gloves when opening the door.
5. For ventilation purposes, some people fire with the lid slightly propped open 1" to 3" during the beginning phase of the firing (if they do not have a downdraft vent system). Be aware of the potential dangers of doing this (heat, live electricity, fumes and potentially cracking the lid) and take appropriate measures to protect yourself and the kiln.

DO NOT UNLOAD KILN WHILE HOT

1. You may burn yourself.
2. You may harm your work.

BE CAREFUL OF SHARP OBJECTS

1. Stilt marks and other sharp protrusions can cut you.
2. Remember that that glaze is like glass.
3. Wear safety glasses while grinding or knocking of stilt marks.
4. Check the shelves for broken bits of glaze, which may have attached to the shelves. These can be like shards of glass that can cause a serious cut.

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VIEWING INTO THE KILN

1. Use dark glasses (shade number 1.7 to 3.0) to view inside the kiln through the peepholes when firing. These will protect you from the radiant infrared radiation and will also protect your eyes in case the ceramic ware explodes. Do not use regular sunglasses for this - they are not designed to protect your eyes from this type of radiation.
2. Use heat resistant gloves when opening peephole plugs. They are very hot and can burn you.
3. Do not open the kiln lid unless the kiln is turned off (except for carefully controlled troubleshooting tests). There is danger from electrocution. Cracks caused by propping open the lid are not covered by the warranty.
4. Use heat resistant gloves when opening a hot lid. 5) Do not open the lid when the kiln is above 121°C (250°F).

FIRING CAUTIONS

ATTEND THE FIRING

1. We recommend attending the kiln while firing.
2. **NO AUTOMATIC SAFETY DEVICE IS FOOLPROOF! BE ESPECIALLY CAREFUL ABOUT ATTENDING THE KILN WHILE IT IS SUPPOSED TO SHUT OFF.** (The Delay feature in automatic kilns gives you control over this).
3. The controller is used to control temperature; it is not a safety device.

PROGRAM REVIEW

1. Review the current program before firing to ensure the correct profile is programmed.
2. You may pick up an important mistake and save a whole load.
3. Hit Review Prog or Review after you have done your programming and the control display will scroll through the program. It only takes a minute or less.

DO NOT CONFUSE CONE NUMBERS

1. Cone ratings are not intuitive. Cones with an "0" in front of them (like cone 05) are lower in temperature rating and the higher the number the lower the temperature rating. On the other hand cones with no "0" in front (like Cone 5) rise in temperature, as the number gets higher.
2. For instance, Cone 05 is a much lower temperature than Cone 5 for instance. If you fire Cone 05 clay to Cone 5 you could cause a serious overfiring of the material which could melt in your kiln and cause severe damage to the kiln interior.
3. See the Orton cone chart.

SHUT OFF KILN AT DISCONNECT OR CIRCUIT BREAKER

1. It is possible for electrical contacts on contactor relays to fuse together.
2. If this happens power will continue to flow to the elements and your kilns could overfire even though everything on the kiln is shut off.
3. You should turn kiln off from the circuit breaker or fused disconnect switch after turning off the kiln itself.

DO NOT FIRE KILN ABOVE 2350F (1290C, Cone 10)

1. **DO NOT FIRE ANY HIGHER THAN THIS** or hold for extended periods of time at those temperatures.
2. The elements and firebrick could melt.

POST FIRING CAUTIONS

CHECK FOR GLAZE AND CERAMIC CHIPS

1. Check element grooves and walls for glaze, clay chips or anything that could melt at a high temperature.
2. If melted clay or glaze comes in contact with an element, a rapid failure could result. The molten material traps the heat radiating from the element and subsequently raises the surface temperature of the wire. The temperature will quickly pass the maximum recommended temperature for the wire and burn it up.

3. To clean grooves, a good shop vacuum will handle dust and loose crumbs. Remember that the elements themselves are quite brittle when they are cool.
4. Remove any glaze that has splattered on the firebrick or shelves. (USE SAFETY GLASSES WHEN DOING THIS BECAUSE GLAZE CAN BE LIKE BROKEN GLASS). Vacuum afterward. Note about vacuuming: it is possible to build up a strong static electricity charge when you are vacuuming. If this somehow manages to discharge into the control it can ruin the electronic circuit. Make sure vacuum is grounded and periodically touch some grounded metal surface away from the kiln to discharge the energy.

GENERAL MAINTENANCE CAUTIONS

ELECTRICAL SAFETY

1. Shut off kiln when servicing it.
2. The elements carry high voltage and can electrocute you. Many of the tests described in the troubleshooting manual are performed under power. They should be done ONLY by someone who is familiar with electrical safety such as an electrician or trained maintenance person.
3. As long as the kiln is unplugged or turned off at the fused disconnect switch or circuit breaker (and checked with a reliable meter to be sure) you are safe.

CHECK WIRES & TERMINALS

1. Check wires for deterioration or oxidation.
2. Replace any that seem brittle or where the wire insulation has deteriorated or fallen off.
3. Check terminals for oxidation (discoloration).
4. If you are near salt air or if you notice corrosion on the stainless exterior of the kiln for whatever reason (like certain fumes generated by your work) then do this far more frequently.
5. Check power connection terminals in the kiln and control box for tightness. Be sure to do this with the power disconnected (unplugged) for the kiln. If these terminal connections get loose heat can be generated (because the electrical resistance gets greater) and this can cause a fire.
6. Check thermocouple connections for corrosion, tightness and oxidation as well. A bad thermocouple connection can change the accuracy of the temperature reading, which could cause an overfiring.

CHECK TEMPERATURE OF CORD

1. Occasionally check temperatures of the main power cord at the main receptacle and the main kiln breaker while the kiln is at its hottest.
2. If these are hotter than normal, it could be a sign of a loose or corroded connection, or possibly the wire gauge used in the power hook-up is the wrong size for the amount of current being drawn by the kiln.
3. Immediately diagnose and fix this because it could cause a fire.

CHECK FOR CORRODED CONNECTIONS

1. At the very least check for discoloration (an indication of oxidation).
2. Electrical connectors will typically oxidize over time where there is heat and this can cause further overheating of the part at the connection point. This can in turn lead to early failure of the part, wire and connector.
3. Make certain that the new connectors are firmly crimped onto the wire.

THE WRONG PARTS CAN BE HAZARDOUS

1. Non-brand elements can present a potential hazard to the kiln or cause a fire (by drawing too much amperage).
2. The wrong type of fuse, relay, switch or other component can cause a fire or other hazardous condition.
3. An improperly rated cord can cause a fire.

KILN MODIFICATIONS CAUTIONS

COATINGS

1. We cannot at this time recommend any coatings for the elements.

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2. Use of ceramic coatings will void the warranty on the elements and potentially the firebrick if it contaminates them.
3. Some people have reported success with ITC coating and some people seemed to have caused problems with this coating.
4. We have not adequately tested these coatings so we can only say, at this time, that any trouble that results from the use of ITC and other coatings must be at the risk of the user.

OTHER MODIFICATIONS

1. All customer modification is made solely at the risk of the customer.
2. Modifications will void the warranty.
3. The manufacturer or distributor takes no responsibility for hazardous conditions created by unauthorized modifications.
4. Any authorization for an engineering change must be in writing from the factory.

DO NOT OVERINSULATE KILN

1. You may add insulation to the bottom, and to some extent the top.
2. If you put too much insulation on a lid it may weaken because it relies on the cooling of the lid to maintain its structural strength. This could lead to cracking or potentially a collapse of the lid.
3. See the various troubleshooting guides for information about this.
4. However, never wrap insulation around the perimeter of a typical sectional kiln.
5. You could trap heat in the wiring boxes and cause an electrical fire.
6. Also the stainless steel wrap that hold the kiln together will expand and loosen the structure of the kiln.