CAUTION INSTRUCTIONS FOR L&L KILNS

CAUTION INSTRUCTIONS

KILNS THIS APPLIES TO

This section covers the caution instructions for the following L&L kilns:

CURRENT PRODUCTION KILNS

- Doll Baby Kilns (DL and DLH Series)
- Liberty-Belle Kilns (LB Series)
- Easy-Fire Kilns (e Series)
- Jupiter Manual Kilns (J Series)
- Jupiter Automatic Kilns (JD Series)
- DaVinci Manual Kilns (X and T Series)
- DaVinci Automatic Kilns (X and T Series)
- Easy-Load Front-Loading Kilns (EL Series)
- Renaissance Front-Loading Kilns
- Chameleon Glass Kilns
- GS1714 and other G Models

OBSOLETE MODELS

- Econo Kilns (K Series and J Series)
- Programmatic Kilns (B Series)
- Dyna-Kilns (C & H Series)
- Dyna-Kilns (SQ Series)
- Enameling Kilns (E48, E49, R Series)
- Oval Kilns (OV Series)
- Most other L&L kilns

DISTRIBUTORS ARE NOT AUTHORIZED TO MODIFY THESE CAUTION INSTRUCTIONS

Distributors and installers of L&L kilns are not authorized by L&L to make modifications or contradict these Caution Instructions (or our Installation Instructions). If L&L's instructions are not followed, L&L specifically disavows responsibility for any injury or damage that may result.

DATED INFORMATION

The information in these Caution Instructions is believed to be correct to the best of our knowledge at the time of publication (see the date at the bottom of this sheet). You can download the most recent update from our web site at *www.hotkilns.com/cautions.pdf* at any time.

RESPONSIBILITY

It is the installer's and user's responsibility to become familiar with the hazards associated with firing a kiln and to plan and act accordingly.

CAUTION INSTRUCTIONS FOR L&L KILNS

INSTALLATION CAUTIONS

FOLLOW INSTALLATION INSTRUCTIONS

See the complete INSTALLATION Instructions in this instruction book for details and cautions for installing your kiln properly. This covers electrical issues, safety codes, clearances and ventilation issues. Specific code requirements are covered in detail.

LOCAL CODES

Local fire and safety codes supercede information that is provided in these Caution Instructions or in our Installation Instructions.

AMBIENT TEMPERATURES

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

CLEARANCES

Make certain floor is not flammable and install no closer than 12" to any wall. (18" is preferable). See the INSTALLATION section for the complete warning with respect to required clearances. In general, it is not a good idea to install a room in a small confined space (such as a closet). Maintain a minimum of 36” between two adjacent kilns especially if they are going to be used at the same time. (Remember that the kilns will heat each other). 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.

VENTILATION IS ESSENTIAL

Kilns generate harmful fumes when firing ceramics. Fumes include carbon monoxide, sulfur oxides, hydrogen fluoride and metal vapors (all of which can be very toxic). Install kiln in well-ventilated area. Never operate in an enclosed space such as a closet unless you have good ventilation. 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 section in this instruction manual. Severe corrosion can be caused by kiln fumes, salt air or other environmental conditions. Good venting can minimize these problems. Ventilation must be to the outside. Be careful not to locate the outlet of the vent near an open window.

CHECK TEMPERATURES AROUND KILN

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

LEVELING THE KILN

Level the kiln while you are installing it. Use thin metal shims under the legs to accomplish the leveling (never wood or other combustible materials). Make sure that the base will not wobble. Leveling is important because the Dawson 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. Also you don't want your ware to be unstable in the kiln. Also 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.

ADJUSTING THE HINGE PROPERLY

See your assembly instructions. The hinge of any kiln must be adjusted so that the expansion caused by the heating process has room to expand. Otherwise you could damage the kiln.

THERMOCOUPLES

Thermocouples (in automatic kilns) must be inserted into the kiln at least 1" in from the inside surface of the kiln. They absolutely must protrude into the kiln itself because if they are in the insulation they will measure a lower temperature than what is in the kiln and this could cause an overfire. Replace thermocouples once they are no longer reasonably accurate.

USE THE SUPPLIED KILN STAND

Do not use kiln without the supplied stand. Never set

a kiln on a floor without significant air space circulating under the kiln. (Our stands typically raise the floor of the kiln by 8" from the floor). Heat will conduct from the bottom of a kiln into any surface it touches. If that bottom is combustible (like wood) it could eventually combust.

Use of a non-L&L kiln stand may void the warranty. For instance a smaller stand or one without as much support as an L&L stand could cause the bottom to crack.

DON'T USE AN EXTENSION CORD

Never use an extension cord with your kiln. Locate the outlet close enough to the kiln to plug directly into it with the kiln's supplied power cord (kilns that pull over 48 amps and some three phase kilns generally will not have a power cord). These kilns need to be "direct-wired" to the power supply.

POWER CORD MUST BE PROPERLY RATED

All L&L power cords are rated for 105°C. Anything less than this can cause a malfunction and possible fire where the power leads connect to the control box.

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.

USE COPPER WIRE FOR HOOK UP

Don't use aluminum wire. It is cheaper to use aluminum wire and you may be tempted to do so. Many electricians will tell you that, with the new types of connectors, it is OK. However, it is of particular importance with kilns not to use aluminum wire for the hook ups. 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. Also, 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. 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

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. Secure it so it can not move. If cord touches the hot case it could melt and cause a short circuit and/or fire.

USE A QUALIFIED ELECTRICIAN

Have electrical installation performed by an electrician or other qualified technician. There is danger of electric shock. (See the INSTALLATION section).

KEEP KILN DRY & IN PROTECTED SPACE

The kiln must be kept dry. It is best to keep it in an enclosed room away from inclement weather. See specific details in the INSTALLATION INSTRUCTION section. Note that our warranty does not cover damage from corrosion and electrical damage caused by inclement weather. Water in contact with a kiln can cause an electrocution hazard.

KEEP A FIRE EXTINGUISHER NEAR KILN

Keep an adequate fire extinguisher near the kiln and check it on a regular basis. 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. Use a fire extinguisher that is rated for electrical fires (we recommend ABC rating).

SPRINKLER CAUTIONS

If you have a sprinkler system be careful to check the rating and location of the heads so that you do not inadvertently cause them to actuate under normal firing conditions. 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.

CAUTION INSTRUCTIONS FOR L&L KILNS

GENERAL ENVIRONMENT

SURFACE IS HOT AND CAN CAUSE BURNS
Kiln surface can be extremely hot (up to 500°F) and can severely burn you if touched.

POST A WARNING SIGN
We suggest displaying a sign near the kiln that specifically warns everyone of how hot the kiln is.

KEEP CHILDREN & ANIMALS AWAY FROM KILN
Protect any children, animals, and unqualified adults (anyone who is not able to understand the cautions outlines in these instructions) that may be near the kiln. Aside from fumes that must be ventilated, and flammability concerns, they must be protected from the heat of the kiln and the electrical dangers. 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
Do not put sealed containers or combustible materials such as solvents, paper, rags, in or near kiln. An explosion or fire could result.

PRACTICE GOOD HYGIENE
Remember that clay contains silica dust which can be harmful (see silica caution) and that many glazes contain heavy metals such as lead, cadmium and copper. While this caution is outside the scope of kiln safety it is worth mentioning here. Keep your room clean and your kiln clean.

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

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

PREFIRING CAUTIONS

PROPER USE OF KILN WASH
Make sure the floor of the kiln and the tops of the shelves are coated with kiln wash. This will protect these surfaces from melting glaze and ceramics.

Do not coat the undersides or sides of the shelves. Do not apply kiln wash to the brick sides or element holders. (Damage to the elements could result).

If you have a Dawson kiln sitter, put kiln wash on the cone supports (not the sensing rod) for accurate cone action. Clean off the old wash and reapply new wash each time you fire or when it begins to chip away.

KILN WASH CONTAINS SILICA
Long term exposure to silica dust could cause lung damage. See the MSDS sheets in the MSDS section. Exercise proper caution when mixing the dry powder and when removing it from your shelves. 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
Do not use silica sand in the kiln (some people like to use this as a work support medium). The silica sand will attack the elements and thermocouples. It can migrate in the kiln from expansion and movement due to heat. If you must use sand to support or stabilize your load try alumina oxide or zirconia oxide sand.

NEVER FIRE MOIST GREENWARE
Never load moist greenware or pots in your kiln. The expanding water vapor in the ware could cause the ware to explode, damaging your kiln interior. We recommend using a dry out segment in your bisque program at 150^{O}F. (Note that, because of the thermocouple offset programmed into our DynaTrol when we use the ceramic protection tubes, the display temperature will read 200^{O}F when the real temperature is 150^{O}F). 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.

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CAUTION WITH USE OF WAX

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

DO NOT FIRE TEMPERED GLASS

Tempered glass can explode when fired.

STORE SHELVES IN A DRY LOCATION

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

DO NOT USE CRACKED SHELVES

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

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. Rocks, marbles, cement and other materials may explode under high temperatures. Before firing anything but ceramics, glass and metal (obtained from a known reputable source) in a kiln carefully investigate what happens under heat. This is the sole responsibility of the user. The kiln is not designed to be used for firing hazardous materials.

LOADING & UNLOADING CAUTIONS

TURN OFF POWER WHILE LOADING

Turn off power to the kiln when loading or servicing. If power is on when you are loading or unloading the kiln it is possible to touch the elements and get electrocuted. 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 IS USE

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

DO NOT STORE ANYTHING ON LID

Do not use the lid as a storage shelf. The lid could crack. 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

Do not open the kiln door until the kiln has cooled down to 250°F (120°C). You could burn your hand on the handle and/or the radiant heat from the kiln. Be careful when you do open the door at this temperature because you can still get burned. Use heat resistant gloves when opening the door. (These are available from L&L). 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

You may burn yourself and harm your work.

BE CAREFUL OF SHARP OBJECTS

Stilt marks and other sharp protrusions can cut you. Remember that that glaze is like glass. Wear safety glasses while grinding or knocking of stilt marks. 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.

SECURE LID WHILE LOADING OR UNLOADING

IF YOU HAVE A SPRING-LOADED EASY-LIFT HINGE

Be sure to LOCK THE LID IN PLACE with the spring-loaded plunger pin located on the side of the hinge.

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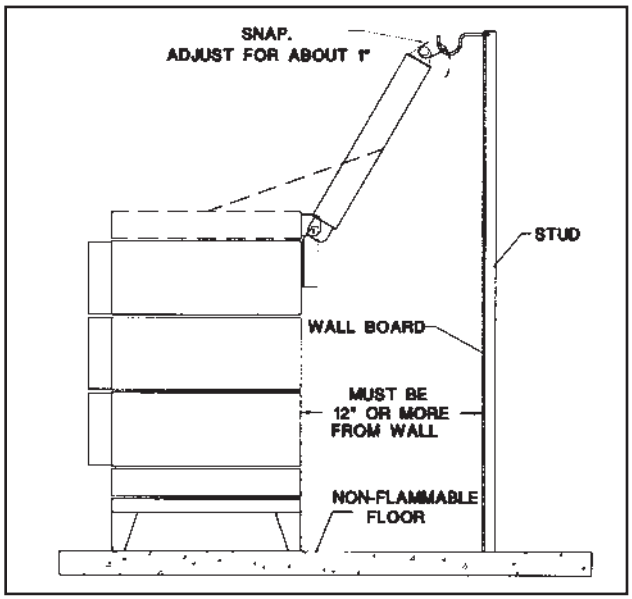
IF YOU HAVE A DAVINCI COUNTERBALANCED LID
Be sure to LOCK THE LID IN PLACE with the safety hooks when in the up position. There is one on each side. Use both chains.

IF YOU HAVE A JUPITER HINGE WITH CHAIN SUPPORTS
A special safety system is supplied with your Liberty-Belle, J18, J18X, J23, J230, J236 or J245 kiln (unless you have the Easy-Lift spring hinge option). This is a door safety chain. It secures the lid in an open position when you are loading or unloading the kiln and insures that the lid can not accidentally come down on you.You must install and use this for your safety's sake. See the below diagram.

This drawing shows the safety chain installation and use for the standard older Jupiter hinges.



FIRING CAUTIONS

DON'T FIRE KILN ABOVE 2350°F (Cone 10)
Most L&L kilns are rated for use to 2350°F (1287°C) (Cone 10). The rating of the kiln is listed on its data nameplate normally affixed to the control panel. DO NOT FIRE ANY HIGHER THAN THIS or hold for extended periods of time at those temperatures. The elements, element holders and firebrick could melt.

ATTEND THE FIRING
We recommend attending the kiln while firing. 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). The controller is used to control temperature; it is not a safety device.

MAKE SURE YOUR DAWSON IS ADJUSTED
If you have a manual kiln (or the Dawson backup on an automatic kiln) be sure it is properly adjusted. See the Dawson instructions. Overfiring could result. Note that the kiln sitter could have gone out of adjustment during shipment. **Do NOT assume that it is adjusted when first firing the kiln.** The tube assembly should be replaced if gets overly corroded or contaminated with condensed glaze or other materials. Dawson recommends checking the pivot point for corrosion and sluggishness every 6 to 12 months.

USE KILN WASH ON THE CONE SUPPORTS
If you have a Dawson kiln sitter, put kiln wash on the cone support (but not the sensing rod) for accurate cone action. This will keep the cones from sticking when they bend. Clean off the old wash and reapply new wash each time you fire.

UNDERSTAND YOUR CONTROL
Become familiar with either the control (if you have an automatic kiln) or the Dawson Kiln Sitter (if you have a manual control or have that as your backup control). Do this before operating the kiln.

PROGRAM REVIEW ON AUTOMATIC KILNS
Review the current program before firing to ensure the correct profile is programmed. You may pick up an important mistake. (Hit **Review Prog** after you have done your programming and the control display will scroll through the program).

DON'T CONFUSE CONE NUMBERS
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. See the Orton cone chart in this book or available on our web site.

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USE THE PROPER THERMOCOUPLE

Never use a different type of thermocouple with your controller unless it has been set up from the factory. For instance if you used a Type S thermocouple on a control set up for Type K you would overfire your kiln.

CHECK THERMOCOUPLE CALIBRATION

Thermocouples will drift in reading over time. This could potentially lead to an overfiring before the thermocouple actually fails. Although you can not easily check thermocouple calibration, the general accuracy of the entire kiln system can be checked by firing with witness cones. See the LOG, CONES & CERAMIC FIRING section.

SHUT OFF KILN AT DISCONNECT OR CIRCUIT BREAKER

It is possible for electrical contacts on contactor relays to fuse together. 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. You should turn kiln off from the circuit breaker or fused disconnect switch after turning off the kiln itself.

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 are available from L&L). 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 250°F

POST FIRING CAUTIONS

CHECK FOR GLAZE AND CERAMIC CHIPS

Check element holders and walls for glaze, clay chips or anything that could melt at a high temperature. 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.

To clean holders, a good shop vacuum will handle dust and loose crumbs. A very gentle chisel or grinder may help with glaze contamination on element holders, but remember that the elements themselves are quite brittle when they are cool. Replace the contaminated holder if you can not clean it. 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

ELECTRICAL SAFETY

Shut off kiln when servicing it. 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. 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 TEMPERATURE OF CORD

Occasionally check temperatures of the main power cord at the main receptacle and the main kiln breaker while the kiln is at its hottest. 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. Immediately diagnose and fix this because it could cause a fire. Also check temperature of any other cords on the kilns (such as element jumper cords).

CHECK WIRES & TERMINALS

Check wires for deterioration or oxidation. Replace any that seem brittle or where the wire insulation has deteriorated or fallen off. Check terminals for oxidation (discoloration). 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.

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.

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 FOR CORRODED CONNECTIONS

When replacing infinite zone switches (and other electrical components), replace the electrical connectors. At the very least check for discoloration (an indication of oxidation). 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. Make certain that the new connectors are firmly crimped onto the wire.

THE WRONG PARTS CAN BE HAZARDOUS

All parts are not the same. Off-brand elements, if not designed properly, can present a hazard to the kiln (by drawing too much amperage). The wrong type of fuse, relay, switch or other component can cause a fire or other hazardous condition. An improperly rated cord can cause a fire.

KILN MODIFICATIONS

COATINGS

We can not at this time recommend any coatings for the elements. Use of ceramic coatings will void the warranty on the elements and potentially the firebrick or element holders if it contaminates them. Some people have reported success with ITC coating and some people seemed to have caused problems with this coating. 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

All customer modification is made solely at the risk of the customer. Modifications will void the warranty. L&L takes no responsibility for hazardous conditions created by unauthorized modifications. Any authorization for an engineering change must be in writing from the factory.

DO NOT OVERINSULATE KILN

You may add insulation to the bottom, and to some extent the top. See the various troubleshooting guides for information about this. However, never wrap insulation around the perimeter of a typical sectional kiln. You could trap heat in the wiring boxes and cause an electrical fire. Also the stainless steel wrap that hold the kiln together will expand and loosen the structure of the kiln. 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.