

Aim Electric Kilns



General User Manual



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1-800-AIM-KILN

Important! Please read all instructions before using your kiln!

General Information

Congratulations on the purchase of your new AIM Kiln, a partner in your creative activity! We sincerely wish you many happy and productive years in the use of your new kiln.

The **firing chamber** of your new kiln is constructed of insulating firebrick. It is an efficient insulator, but extremely fragile and should always be handled with care. The high temperatures required to fire create tremendous stresses within the kiln, causing the brick to actually expand and contract with each firing. You may begin to notice hairline cracks in the bricks; they are simply expansion cracks and do not effect the functioning of the kiln. The lid is coated with a thin, high-temperature refractory paint which makes it more durable and prevents dusting of the brick particles onto your ware.

Your kiln is equipped with iron-chromium-aluminum **elements**, or heating coils. They are pinned in place to prevent contraction and intrusion into the firing chamber. The elements become brittle after a few firings. Care should be taken not to bump them, or breakage may occur. When you first turn on your kiln, you will hear a "hum" for a short time; this is normal kiln function. An element is designed to have a very long life and is capable of many firings. However, their lifespan can be shortened considerably by contact with materials such as bits of bisque, glaze, cones, metal or kiln wash. Keep your kiln clean by vacuuming the inside regularly.

Peepholes allow viewing of the firing chamber and witness cones during the firing. They also provide an escape for water vapor and gases. For each peephole you will be provided with a peephole plug to insert during firing. Its tapered shape ensures a good fit for heat retention. Be sure to wear protective goggles when viewing inside the kiln to protect your eyes from infrared heat.

All kilns (with the exception of the 3500 series) have been supplied with a **wedge brick**. Use this if you wish to prop the lid open during the early stages of most firings.

Your kiln must be fired on the **kiln stand** provided as it has been specifically designed for each kiln. The space below the kiln is necessary for air circulation and the prevention of heat build-up. To avoid uneven glaze flow and problems with the kilnsitter ALWAYS MAKE CERTAIN THE KILN STAND IS LEVEL AND THE KILN IS CENTERED ON IT.

The **lid brace** holds the lid open for loading and unloading. When opening the lid, always lock the brace by pulling its center toward you until a click is heard. To release the brace, depress the button on the side of the brace and gently push its center back.

On manually operated kilns, **infinite switches** cycle on and off giving intermittent clicking and popping sounds. The cycling frequency will decrease as the switch setting increases until you reach the "HI" setting, when no cycling occurs. The numbers on the switch knobs indicate the percentage of power to the kiln. Number 2 is equivalent to 20% of power, number 6 is 60% and so on, up to HI which is 100% of power.

The **stainless steel jacket** of the kiln is made of high quality steel, secured by adjustable clamps. The function of the jacket is of course to hold the bricks in place, but also to reflect heat back into the kiln, making it more efficient. The jacket will become hot during firing, so use extreme caution and do not touch during firing. The stainless steel may discolor eventually from both the heat and gases released from the pieces being fired. You may use stainless steel cleaner or glass polish to keep your kiln shiny and new-looking.

The **kilnsitter** is a mechanical control that will shut off your kiln. A pyrometric cone is inserted into the end of the kilnsitter inside the kiln, and when it reaches maturity and bends to the proper angle, your kiln is shut off. When the kilnsitter is "off", the kiln cannot fire. Although the kilnsitter is often called the "automatic shut off", the kiln should not be left unattended. Ware could fall against the sensing rod which could cause overfiring and damage to both the ware and the kiln. The kilnsitter should be adjusted before the first firing and again after each 20 subsequent firings.

Kilnsitter adjustment: 1) turn all switches to "off" (IMPORTANT!), 2) Install the firing gauge (see kilnsitter operating manual and follow all instructions to make adjustment)

Kiln Installation Procedure

Convenience is the main thing to consider in locating your kiln. Equally important, though, is to ensure the safety of the kiln's operation. The following precautions should be taken:

- Plan your firing area near a present electrical outlet or where a new circuit can be easily and economically installed. your kiln will perform properly when plugged into an electrical outlet that will not be used for any other purpose while the kiln is firing.
- Be certain that your electrical outlet has the correct capacity and voltage. Specifications are shown on the AIM product label on the kiln. The outlet must be in good condition or overheating of the cord may result.
- Place the kiln in a well ventilated, covered, and protected area such as a garage, basement, utility room, or porch.
- Provide a minimum of 12 inches clearance between the kiln and wall(s)
- Never allow any combustable materials near the kiln. Good housekeeping must be practiced at all times in the kiln area for safety.
- Position the kiln on a level surface that will not be damaged by heat. A metal sheet or other protective

material may be used beneath; avoid placing the kiln on rubber tile, linoleum, or any surface that may mar or discolor when heated.

-Locate the kiln in an area where it can be easily loaded and unloaded, but out of the way when not in use.

-Do not allow the power supply cord to come into contact with the side of the kiln. The stainless steel jacket will become hot during firing and touching could cause damage to the cord set.

-There is little danger of serious burn from accidental contact if you use the same caution used with an iron. However, ALWAYS KEEP CHILDREN AWAY FROM THE FIRING AREA!

Kiln Preparation

1. Remove all dust and brick chips from the interior of the kiln by using a vacuum cleaner. Be certain to vacuum around the elements too. Dust in the kiln might land on a glazed piece and cause an imperfection.
2. Wipe shelves clean and apply kiln wash.

Kiln Wash

Kiln wash is a product used to protect kiln floors and shelves from glazes. It creates a buffer zone between the ware and the shelf, preventing it from sticking. Kiln wash is made of Koalin (china clay) and flint (potter's silica). Both have good refractory properties and without flux will not fuse at the temperatures you will be reaching. The kiln wash powder is mixed with water, making a creamy, somewhat thin, paint. Apply it with a paint brush to the shelves and floor of your kiln. Apply to one side of the shelves only. Two or three coats is sufficient; let them dry completely before using. Apply kiln wash to the floor of the kiln. Leave a 1" border around the outer edge (where the kiln wall meets the floor) uncoated to provide a breathing space for the kiln. Be very careful when applying wash to avoid getting any of it in the element grooves or on the elements themselves.

First Firing

1. Vacuum your kiln.
2. Apply kiln wash.
3. Clean shelves after each use. After a glaze firing, they may need patching, or possibly a complete recoating with kiln wash.

We recommend that the kiln be test fired empty the first time. The "test firing" will burn off the coating on the elements and will also remove any moisture in the kiln. During this firing you may notice a slight smoking and odor. This is the coating and any accumulated dust on the elements and is completely normal. For the test firing use the 020 cones provided, and, before starting, be sure to adjust the kilnsitter according to the instructions in the kilnsitter manual.

The first actual firing (after the test firing) should be a bisque firing only. Do not be in a rush, take it slowly and carefully. Study this manual and the kilnsitter manual, and make note of things you wish to remember.

Time schedules shown are BASIC ONLY. You may find you need to change the time intervals or switch settings as necessary for your ware. Don't be afraid to experiment! That will be the basis of growth in your craft. If you wish to change firing times from the ones outlined in this manual, time intervals may be increased or decreased. Generally speaking, the greater the maximum (cone) temperature, the slower the progression of increase. Slow heating and cooling brings quality results.

Loading Your Kiln

1. Load only bone dry green ware. Ceramic greenware should be dried for at least two days, with larger or thicker pieces requiring even longer. Glazed ware should dry for 6 hours before firing.
2. Plan the load before starting. Arrange the load so thick and thin walled pieces will be mixed through the kiln to give a uniform density.
3. It is best not to load pieces directly onto the kiln floor.
4. The bottom layer should either be stilted or loaded on a shelf supported by 1/2" posts, to allow adequate heat distribution.
5. Place small, low pieces on the bottom shelf, and taller pieces on top. This enables loading with shorter posts.
6. Allow at least one element groove between each shelf. If your kiln has a blank extension ring, let at least two element grooves contribute to the heating of the blank space.
7. Do not jar the kiln after loading has started, to avoid knocking down items and possible breakage.
8. Keep shelves and ware at least 1" from the kilnsitter sensing rod, and 1/2" from the wall of the kiln. At least one element groove must be between the top shelf and the top of the kiln.
9. If large, flat pieces are being fired, place them so the edges of the piece are between the element grooves instead of right on the groove to lessen the possibility of uneven heating.
10. Place the shelves in the kiln carefully! The firebrick is quite fragile and bumping it with shelves can cause damage.
11. If a witness cone is being used, it should be placed 3" behind the peephole so it will be completely visible.

Normal Operating Instructions

1. Turn all switches to "off". The life of the kilnsitter will be increased if switches are off before engaging the kilnsitter.

2. Apply a thin coat of kiln wash to the top of the cone supports and bottom of the sensing rod where it will come in contact with the cone. Allow it to dry.
3. Raise the weight up against the guide plate.
4. Press the claw down lightly until it engages the trigger.
5. Insert the cone. While holding the claw down over the trigger, carefully place a small cone flat on the cone supports with the inside edge of the number circle on the cone even with the outside edge of the cone support. Cone should be against the metal step of the cone support, with the center of the cone parallel with the end of the tube. (If witness cones are being used, they should be the same number as the small cones in the kilnsitter). The shut-off temperature of the kilnsitter can be varied slightly by the position of the cone. A thin section of the cone under the sensing rod will cause shut-off sooner than the thick section. Always be certain at least 1/16 inch of cone is overhanging the cone support of each side or an early shut-off may occur.

To Prepare a Load for Bisque Firing

1. Turn all switches to "off". (If your kiln has no switches, simply unplug)
2. Open or remove lid.
3. Load ware, keeping in mind the instructions above.
4. Set pyrometric cone, or witness cones.
5. If the kilnsitter has a timer, set it 1/2 to 1 hour beyond the expected firing time. In most cases, 6 1/2 hours will be sufficient.
6. Lower the lid, leaving it cracked open with the wedge brick (or, on larger kilns, the notch on the hinge brace).
7. Insert all peephole plugs except for the top one.

Bisque Firing Schedule

<u>Switch setting</u>	<u>Time</u>	<u>Lid</u>
#2	1 hour	cracked open
#2	1 hour	closed
#4	2 hours	closed
#6 or higher	until cone bends	closed
OFF	overnight	closed and all peephole plugs in

NOTE: Kilns with AUTOMATE II or Heat Controller: total turn-up time is 4 hours.

After Firing

1. In the morning, crack the lid open and remove the peephole plugs.
2. Remove the pieces when they are cool enough to touch.

Porcelain and Stoneware

To fire stoneware or porcelain, it is necessary to fire a high temperature, and consequently the ware becomes much softer than ceramic ware. Pieces may stick together while firing if they touch. It will also tend to distort the shape unless the maximum temperature is accurately controlled and the piece is properly supported.

Porcelain and Stoneware Stacking

Stilts cannot be used to support porcelain bisque as they will adhere to the porcelain when heated to the high temperatures required. Hollow posts made of the same material as your ware are often used for support. Shrinkage and expansion of the support is then the same as your pieces. Be certain to use powdered silica (flint) at any point where contact is made between the ware and the support.

To Prepare a Load for Porcelain or Stoneware Firing

Same as above for Bisque firing.

Porcelain or Stoneware Firing Schedule

<u>Switch Setting</u>	<u>Time</u>	<u>Lid</u>
#2	2 hours	cracked (top peep open)
#2	2 hours	Closed
#4	2 hours	Closed
#6	2 hours	Closed
#8-HI	Until cone bends	Closed
OFF	Overnight	Closed (peepholes closed)

NOTE: Kilns with AUTOMATE II or Heat Controllers: total turn-up time is 8 hours

1. In the morning, crack the lid open and remove peephole plugs.
2. Remove the pieces when they are cool enough to handle.

After Firing

Same as for other firing.

Glaze Firing

Glaze is a finely ground glass suspended in a liquid. In a glaze firing, the glazes on the ware melt and will stick to anything. Great care must be taken in stacking for a glaze firing to assure that the pieces will not stick to each other or to the shelves.

Stacking for Glaze Firing

Start with a clean kiln. Vacuum the inside and inspect the shelves. Chip off any residual glaze particles and patch with kiln wash. Place the largest pieces in the center of the shelf. Pack the kiln as evenly as possible. **DO NOT LET PIECES TOUCH ONE ANOTHER!** Glazed pieces must either be dry footed or must be stilted. Ware should be placed not closer than 1/2" from the next piece, since glaze bulges before it smooths to its final surface.

To Prepare a Load for Glaze Firing

Same as above.

Glaze Firing Schedule

<u>Switch Setting</u>	<u>Time</u>	<u>Lid</u>
#3	1 hour	wide open
#3	1 hour	cracked
#6	1 hour	closed
HI	until cone bends	closed
OFF	overnight	closed

Gold or China Firing Schedule

<u>Switch Setting</u>	<u>Time</u>	<u>Lid</u>
#2	1 hour	wide open
#2	1 hour	cracked
#4	1 hour	cracked
#6	until cone bends	cracked
OFF	overnight	closed

NOTE: Kilns with AUTOMATE II or Heat Controllers, total turn-up time for either is 3 hours

After Firing

Both same as other firings.

Kiln Care and Maintenance

The life of a kiln can be extended for many trouble-free years of service if routine maintenance is performed. This maintenance should include:

1. Examine the interior of the kiln to ensure it is clean and free of dust. Check the lid and wall brick for loose fragments which might fall on your ware. If possible, vacuum the interior to remove all dust and any foreign material from the elements.
2. Check the floor of the kiln and the kiln shelves to be sure the coating of the kiln wash is adequate. Check the condition of your shelves and posts for warping or cracks.
3. Check the kilnsitter's operation by raising the weight and pressing the claw down lightly until it engages the trigger. Insert your finger into the hole and push the plunger in until it locks. Release the claw, allowing the weight to fall and deactivate the kilnsitter. If it does not release, do not fire the kiln until a check of all kilnsitter adjustments have been made.
4. Check the sensing rod for free, centered travel. Continued operation at high fire temperature will eventually cause the end of the rod to deteriorate or bend. This will affect the adjustment between the trigger and claw. If this occurs, the rod must be replaced.

Occasionally:

1. Expansion and contraction of the kiln during firing will eventually cause the stainless steel jackets to loosen. You may periodically tighten the clamps on the jacket, lid, and bottom of the kiln; do this WHEN THE KILN IS WARM. Care should be taken not to strip the clamps by over-tightening.
2. Remove any glaze spots from the walls, bottom, or shelves prior to the next firing. If this is not done, glaze will remelt and spread with each firing. Elements will also be damaged by direct glaze contamination.
3. Be extremely careful of the inter-box connection alignment when assembling or disassembling an AIM kiln.
4. If the lid of your kiln appears to gap in front, after a number of firings, it is a common occurrence due to differences between expansion between the top of the lid and the underside which is exposed directly to the heat of the kiln. Loosen the hinge screws one half turn, while the kiln is hot. This allows the lid to reposition itself and compensate for the expansion. After repositioning, retighten the hinge screws.

Trouble Shooting

The suggested sequence for trouble shooting your kiln:

1. Check fuses or breakers.
2. Check the wall outlet for proper voltage.
3. Check the wall outlet and kiln plug for loose or discolored blades or connections.
4. Do a visual inspection of the kiln wiring, looking for burned or discolored wires or connections. Check for broken elements and faulty interbox connections.

Solutions:

1. If a fuse blows or breaker trips:

- a. Inadequate household wiring is a possibility. Check label plate of your kiln to determine fuse and breaker requirements. The fuse must have amperage capacity equal to or larger than shown on label plate. If not, call a qualified electrician. Do not merely install a larger fuse. Breaker amperage is usually shown at the end of toggle handle.

- b. Check to see if other appliances, lights, etc. are on the same line. If this is true, check to see if the breaker or fuse is large enough to handle everything on that line.

2. If kiln does not heat to maximum kiln temperature in less than 10 hours:

- a. Check to see if all elements are heating.

- b. Turn all switches to maximum heating, with lid closed. In 15 minutes, unplug the kiln, open the lid, and cautiously feel the brick in the bottom, middle, and top. If one section is relatively cool, the element is either burned out or the input control is defective.

- c. If your kiln is less than 3 years old, and usage has been moderate to light, it is probably a burned out switch.

- d. If your kiln is over 3 years old, or has had continuous and frequent usage, the elements may be in need of replacement.

A Word About Element Maintenance

The elements in your AIM Kiln will last quite a long time with *normal* use. A properly designed element will not burn out prematurely. As an element ages, it will gradually draw less and less power, until it reaches a point where it will not develop enough heat to bend the cone. Elements should be replaced when firing time becomes excessive.

Elements will be damaged by contact with silica or silica bearing compounds. Glazes and kiln wash both contain large amount of silica and care must be taken to prevent either from coming in contact with an element. If silica touches the elements, it will cause them to burn out at the point of contact. Element damage of this type, which requires elements to be replaced, is not covered by our guarantee.

Reduction firing burns the oxygen in your kiln and will ruin your elements. Reduction firing is at your own risk, and elements ruined in this manner are not covered by our guarantee.

Elements are fastened in the grooves with element staple pins made of the same high temperature alloy wire as the element itself. Never substitute any other kind of wire for the staple pins. Should the elements bulge out of the grooves, they must be reset immediately.

It is important to remember: the elements in your kiln must be handled VERY carefully. The alloy wire becomes brittle after being heated to a high temperature, and will break, if an attempt is made to bend or move them while they are cold. They may be safely bent or reset only when heated to a few hundred degrees.

Turn the kiln switch to "HI" and allow the elements to heat until they show a dull red glow. Turn switch to "OFF". With a pair of long nosed pliers, compress the bulging portion of the element by pressing the individual turns in the coils together. Try to compress evenly so no two turns of the element will be pressed tightly enough to touch. As it "shrinks", work it back to the groove and into place. You must work as rapidly as possible, and at the first sign of stiffness in the coils, stop bending and reheat the kiln. The elements do not have to be red to be bent safely. And as cooling occurs, you can feel the stiffening through the pliers. To lengthen the element to fit into the corners, reverse this process, and expand the distance between the coils by use of snap ring pliers. Use extreme caution, as the guarantee covers only elements that fail in service under normal use, and not from being broken when cold.