

Mistakes to Avoid in Maintaining Your Glass Kiln, Part One

by Arnold Howard

In working on kilns at schools and studios, I often find errors made during previous repairs. The photos shown here are from the kilns I've worked on.

Always take your time when you work on your kiln. Never rush through a repair. Preparation for the repair sometimes takes far longer than the repair itself. Avoid making these mistakes and watch for them in used kilns that you are evaluating for purchase.

- **An enlarged thermocouple hole.** The thermocouple is a small rod that measures the temperature inside a kiln. (Photo 1) It goes into the firing chamber through a hole in the kiln wall. If that hole is enlarged, air will pass around the thermocouple and change the temperature reading. You can correct this by stuffing the hole with ceramic fiber. (Photo 2)

- **Crimp cap and wire terminal failure.** A crimp cap is a brass barrel that holds electrical wires together. After the cap is crimped, a nylon cover is inserted over the cap to insulate the wires. The Buchanan crimp cap is far more secure than the wire nuts found in older kilns.

When installing a crimp cap or a wire terminal, avoid getting insulation from the wire inside the cap or terminal. The insulation can weaken the connection, because it creates a gap between the wire and the cap or terminal. A weak electrical connection in a kiln eventually overheats. (Photo 3)

- **Debris in the element grooves.** When an element burns out due to contact with glass particles or glass separator, remove the debris in the groove from the old element before you install the new element. The debris can contaminate a new element.

Photo 4 shows the debris from a previous element hidden under the one I removed. The previous element had failed where the coils had bunched up and overheated. The coils were so hot that they ate into the firebrick groove.



(Photo 1) Notice how large the hole is where the thermocouple enters the firing chamber. The gap around the thermocouple allows air to change the accuracy of the temperature reading. The thermocouple should have a snug fit. The hole in this picture may have held a wider thermocouple that was replaced with a thinner one.



(Photo 2) You can stuff an enlarged thermocouple hole with ceramic fiber to prevent the flow of air around the thermocouple.



(Photo 3) After I replace a part, I often cut it open to find out what caused it to fail. In this case, the insulation from the thick wire on the right was up inside the brass connector barrel, creating a gap that prevented a good connection between the wires. You can see the heat damage on the nylon cover.



(Photo 4) After removing an element, I found particles from a previous element that had been left in the groove. You can see coils from the previous element in the photo. Always take the time to dig out metal particles, glass, or darkened areas of the groove before installing new elements.

Sometimes firebrick and clay particles accumulate in the brick grooves, reducing the efficiency of the elements and preventing them from dissipating the heat. This causes elements to fail prematurely. (Photo 5)

- **Bunched up element coils.** In many front-loading kilns, the elements each take up two rows of grooves. The grooves curve downward in a semicircle to the next lower groove. The element coils tend to bunch up at the bottom of the curved section, causing the element there to get too hot and burn out. (Photo 6 and 7)

When replacing an element that has a semicircular groove like the one shown in photos 6 and 7, place three element pins in the groove. Evenly space the element pins to prevent the coils from forming a cluster at the bottom of the curve.

- **An enlarged element hole.** Elements have two twisted ends that are inserted into holes in the kiln wall. Be careful not to enlarge the holes. This can allow heat into the kiln's switch box and burn out electrical components. (Photo 8)

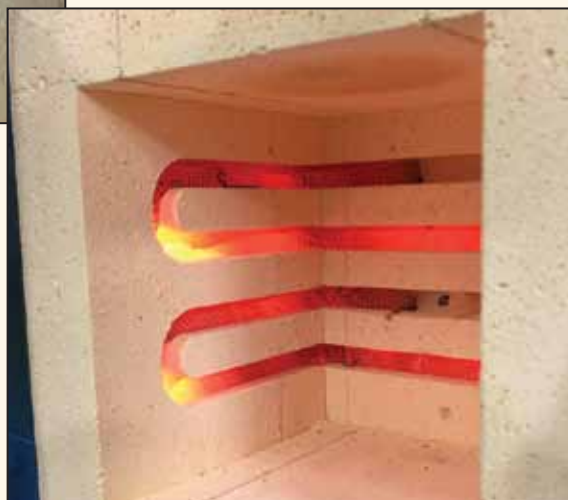
I learned about the enlarged element holes from Mike Glotfelty of Jen-Ken Kilns. Thank you, Mike. **GPO**



(Photo 5) The element here is half buried in firebrick particles. This reduces the heating capacity of the elements and slows down the kiln. Occasionally vacuum the firing chamber. Always wear a dust mask when vacuuming your kiln. Keep the vacuum nozzle away from the thermocouple and controller to avoid damage from static electricity.



(Photo 6) Notice how the element coils have bunched up in the bottom of the groove where it curves in front of the kiln door. Bunched element coils get too hot. You can reduce this by inserting three evenly spaced element pins in the curve.



(Photo 7) In this photo, you can see that coils pressed together get hotter than the rest of the element. That section of the groove glows brightly.



(Photo 8) This is the firebrick hole where the element goes through the kiln wall. If the hole is enlarged, heat will build up inside the kiln's switch box, causing the element connectors to become too hot and fail prematurely. An enlarged hole is usually oval shaped like this one.

While Arnold Howard worked at Paragon Industries, he saw kiln controls evolve from switches to touch screen displays, tested the early glass kilns, and wrote instruction manuals. Arnold now owns Howard Kilns, LLC, a kiln repair and sales business and works on all brands of electric kilns. Feel free to contact him at arnoldhoward@gmail.com or call/text (972) 333-1437.

