



The Making of a Great Ceramic Emitter



Measurement of the slip's pint weight must be exact

The recipe creates a liquid clay called *slip*. It is poured into a plaster mold, where it quickly sets. The mold creates the different shapes and sizes of ceramic products and can make even minute differences in delicate spots such as the definition of the tower and the exact curve of the arc.

A Photo Tour of Our Factory

Ceramic products ranging from fine china to lawn ornaments are composed of a large variety of ingredients that cause major differences in their ceramic bodies such as shrinkage, durability, coefficient expansions, dielectric strengths, and tensile strengths. These clay mixtures also call for precise measurements. A small discrepancy can cause large deviations. All of our ingredients must be imported from the United Kingdom since none are native to America.



Filling the molds with slip



Coil placement can be critical to an element's performance

Coiled resistance wires are then carefully placed into the setting slip, creating the biggest difference between ceramic emitters and other ceramic products. This product has now been given the ability to become *electrified*. Type of wire, gage, and arbor size determine the wattage and voltage. Placement of the wire can cause vast differences between ceramic emitter products as far as consistent surface watt density. This requires a lot of training and a delicate touch.



A new element is “born”

Slip is poured on top of the wire through the top of the mold and allowed to set for several hours until the element can be taken out of the mold carefully without damage. This is the stage I refer to as the “birth” of an element, and just as with any newborn, they must be handled carefully. Until they are completely dried, the clay can be easily moved causing even slight changes in its shape.

Fettling is an old word that means to “make ready”. After the elements are dried, they are fettled to take away any unneeded clay leftover from the mold called *flashing*. Because the clay has not yet been fired, it is still soft and easily broken or damaged. Again, a light touch is needed for this process.



Fettling an element can be done with many types of tools



Loading elements into the kiln

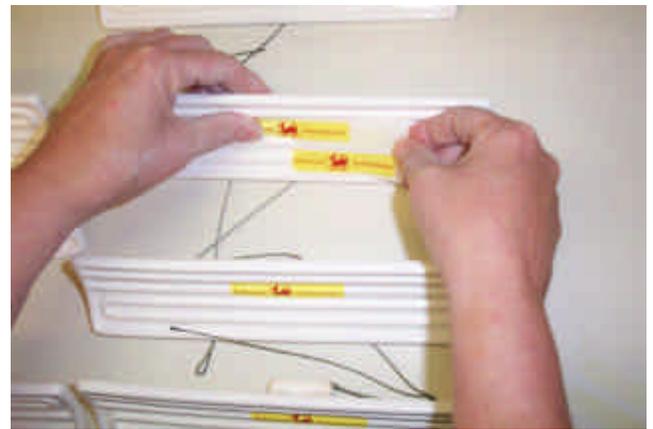
Kiln firing is “oven-baking to the max.” And, just as with kitchen ovens, they can either be gas or electric. Firing time and temperature is as critical to ceramic elements as it is to chocolate chip cookies. Over firing can cause the vitrification or hardening of the clay body, under firing can cause the element to become too hydroscopic or absorbing. All firings need to be monitored by precise controls to specific temperatures. And if things aren’t bad enough, these elements have to be fired three times throughout the production process!



Glaze dipping

Glazing is like putting the frosting on the cake, only these “cakes” have to be frosted all over, evenly, not too thick, not too thin, and there is a specific “frosting” to match all of the different clay bodies that are available. If the glaze doesn’t match, it will not expand with the body during firing and crazing, or cracking, will develop. The glaze forms a protective coating around the element, keeping moisture out and allowing the surface to be cleaned. Elements can be sprayed, dipped, or even painted with one or more glazes depending on the effect desired. Colors are also a creative option, though add nothing to the function of the element. Companies offer yellow, black, rose, green, and the standard white.

Decals are as easy to apply as any water-based transfer. Our special logo is also heat sensitive and serves as an indicator that all elements are functioning. Lower priced elements may be stamped, eliminating the need for a third firing. Many customers take advantage of the decal option and create their own private logo.



Our logo being slid on



Adding the beads is a small, but important final step in the production process

Beading can be time consuming, especially if they are hand fed in the traditional method, but they are of extreme importance. The beads must provide protection from exposure to the leadwire along with flexibility. Interlocking beads are the best and there should be no visible spaces between beads.

The most important lesson to be learned from this photo tour is that **all ceramic elements are not created equal**. Some are mass produced, automated in all or some areas, or all done by hand. It usually depends on the quantities being produced and any specialties being requested. However, major differences between emitters result from production methods and materials used, these differences are usually indicated through the selling price and operating performance. It is important that the seller and buyer understand exactly what they are getting for the price they pay, and a good knowledge of “The Making of a Great Ceramic Emitter” helps.

Coming in the June issue of ~~The Salamander News~~ . . .



WHAT'S HOT and what's not

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The readership of *The Salamander News* has expanded and as you have seen, the products featured now go beyond just ceramic heaters. Our focus will now be on “heating solutions” with all electric heating products. Starting next month, “*The Salamander News*” and our dragon, will take on a new look. The newsletter will now be called “**WHAT'S HOT, and what's not**”, and our dragon has moved from medieval times to the 21st Century.

What are the office cats Midnight and Sydney up to this month?

VACATIONING

They are on a 2 week Spring Break at the beach! Unfortunately they are coming back early because they were kicked out of their hotel for fighting with the other guests. Look for them in the June issue.

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