

DRYING & FIRING

QUESTIONS & ANSWERS



by Cameron G. Harman Jr.

Q For a number of years, I've been drying my pottery by placing the ware on shelves in a corner of my studio. Recently, someone suggested that I should invest in a climate-controlled dryer. How do I know if this is a good investment?

A A lot of artists and small pottery producers simply place their formed ware on shelves and wait a few weeks until the drying is "complete." If their products dry easily, this can work rather well. However, there will still be some losses due to inconsistent or incomplete drying, and these losses cost the producer money. Additionally, not everyone has enough space in their studio—or enough time in their schedule—to simply set their products on racks and wait several weeks for them to dry.

A better way to dry pottery is to place the ware in a space that is climate-controlled with a constant, even air velocity. It is not enough to simply have a controlled climate. If the space used for drying is too large, the air velocity cannot be controlled throughout the load, and this will result in uneven drying. Additionally, the amount of humidity in the air will increase as the air passes over the product. The more ware it passes over, the more humidity it will pick up and the less drying it will do. In a room-sized dryer, the air can collect so much humidity that the products can still require a week or more to dry. Drying-related defects are also common, since a large portion of the air moving in the dryer is not controlled.

Both the air velocity and the difference in moisture content between the

saturated air and actual air influence the drying process. The higher the temperature, the more moisture air can hold. It is also true that the lower the relative humidity (i.e., the amount of moisture in the air being sent into the dryer) the more moisture it can hold.

This explains why warmer air can dry faster than cooler air. Since warm air can hold more moisture, it will pick up more moisture from the product. However, if the air is too warm, it will dry the surface of the ware too quickly. The outer surface will then shrink before the wetter internal layer has started to move. This differential movement creates stresses in the weak ceramic, which often lead to warping or cracking.

The best way to dry is to start out with a high relative humidity and a low temperature. This inhibits the rate of drying and allows the internal moisture to escape from the ware without drying the surface and creating stress in the piece. The temperature can then be gradually increased and the relative humidity lowered to complete the drying process—usually in a matter of hours rather than weeks.

Achieving this level of controlled drying typically requires an environmental chamber. With a well-designed, appropriately sized, climate-controlled environmental chamber, you can quickly and easily dry your products and reap a fast payback through improved quality and productivity. 🌐

Editor's note: For in-depth articles about what happens to ceramic ware during the drying process, visit *Ceramic Industry* online at www.ceramicindustry.com.

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