



Clayworks

Fusing Glass in a Pottery Kiln

Whether it's for firing glass or clay all kilns work basically the same way to convert electricity into heat. There are some similarities and there are some differences. You can fire pottery in a glass kiln and you can fire glass in a pottery kiln but there are definite restrictions with each. Pottery kilns are not as temperature accurate as glass kilns and glass kilns can't fire to as high a temperature as pottery kilns.

Glass Kilns

Because the need for temperature accuracy is significantly greater for firing glass, glass kilns have lid elements and, unlike pottery kilns, are only deep enough fire on a single level. For glass projects a temperature error of only 10°F can ruin a project.



14 in square 6 in deep glass kiln

Pottery Kilns

Ceramics are more forgiving of temperature variance. An error of as much as 50°F is usually acceptable. Also, pottery kilns are deep enough to allow projects to be loaded in multiple tiers.



21 in diameter 27 in deep pottery kiln

Key Difference

The most significant difference between firing glass and clay is in the firing schedules. Kilns that fire using cones would be turned on to heat full on up to desired temperature than turned off to cool. Glass artists learned that glass will crack if heated too fast and will crack if cooled too fast. They also learned that just reaching the desired temperature wasn't enough to complete the firing. It had to be held at the top temperature long enough to complete the process. Until electronic controls were available, glass artists had to babysit their kiln switching it on or off to control the needed temperature change. The introduction of electronic controllers on kilns allowed users to program the kiln and leave it to go through the desired firing schedule.



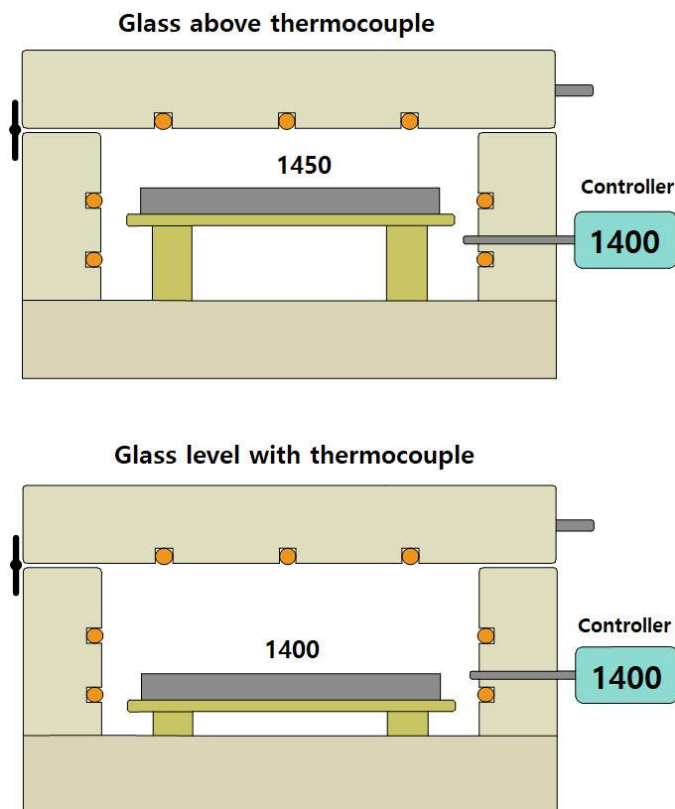
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Firing Glass in a Pottery Kiln

When firing in a kiln heat rises - so the top of a kiln is hotter than the bottom. A thermocouple in the kiln reads the air temperature. The only level where it reads it accurately is level with the thermocouple. To fire glass in a kiln you must position a kiln shelf on posts so whatever sits on it is level with the thermocouple.

This diagram shows how something positioned on a shelf above the thermocouple will not be the temperature the thermocouple reports.



Firing Clay in a Glass Kiln

Glass kilns are not intended to fire to temperatures high enough to glaze clay but can fire high enough to bisque. Almost all glass kilns are preset as a safety feature to not be fired about 1700°F (927°C). This is high enough for any glass project but electronic controllers can be reset to fire higher. Usually the option for maximum temperature is 1700°F, 2000°F or 2400°F but few glass kilns are able to fire higher than 2000°F (1093°C).

Special Issues

Manual Kilns. The complexity of controlling the speed of temperature increase or decrease, along with need for hold times at a set temperature, makes it unrealistic to try firing glass in a pottery kiln that uses pyrometric cones to regulate firings. Firing glass in a pottery kiln that has electronic controls is exactly the same as firing in a glass kiln.

Annealing Glass. When glass has been heated and expanded then cooled to contract, it has been stressed. If that stress isn't adequately released the glass will crack. A critical part of the kiln firing for glass is to hold at a specific temperature to release the stress. This is easy to do with electronic controls but very difficult with manual controls.

Heatwork. The same combination of time and temperature that applies to firing clay applies to glass. For both glass and clay there is a near perfect relationship where every extra minute of time held at a set temperature provides the same additional heatwork as going to 1°F higher temperature. For example, 1900°F held for 50 minutes produces the same result as 1950°F.