

Microwave Kilns

by Jessica Knapp

Many people know that a microwave oven can be used to dry clay quickly when you're in a pinch. Dielectric heating (the type used in a microwave oven) is also used in industry to fire ceramics for high-tech applications. This option is also available on a small scale to the studio potter, at least for firing tests and small objects using a microwave kiln.

A microwave kiln is a container kiln consisting of a base and hood made for use in a household microwave oven. The kiln is made of a white insulating fiber and lined on the inside of the chamber with a black compound that absorbs the microwave radiation and heats up to 1650°F or approximately cone 010 (figure A).

The heat from this compound is then transferred to the chamber and to the piece being fired. It takes between 5 to 10 minutes to reach peak temperature ranges depending on the size of the microwave kiln, the work being fired, and the microwave's wattage. After the firing, the kiln needs to cool for at least 20 minutes before being opened.

Designed for working primarily with small glass objects or precious metal clay, the microwave kiln is also suitable for firing small clay pieces, from beads and pendants to test tiles or small sculptural objects. The kilns come in three sizes. The small and medium size have a firing chamber that's 1¾ inches in height, and a diameter of 2¾ inches and 4½ inches respectively. The chamber in the large kiln measures 6¼ inches in diameter by 2¾ inches high.

The optimum firing time for various materials and sizes needs to be determined through test firings. Spectrum Glazes, one of the kiln's distributors, sells a range of glaze pens formulated specifically for the kiln (see figure A) but overglazes, glazes, and clays formulated for a range between cones 018 and 010 can be successfully fired.

USING THE KILN

First, cut a piece of kiln fiber paper to size. The fiber paper is usually provided as part of the kit (see figure A), but can be replaced by pieces of Bullseye Thin-Fire paper used for glass work. The fiber paper prevents anything from sticking to the insulating fiber base.

Place your piece on the fiber paper and test fit the cover to be sure the piece does not hit the top or sides of the firing chamber (figure B). Place



the base in the microwave and cover with the lid. Be careful; the black coating on the inside of the lid is delicate and cracks off easily if bumped. Set the microwave timer based on your tests. Once the microwave turns off, you'll notice an orange glow coming from the vent hole in the top of the kiln.

Take the kiln out of the microwave immediately to prevent damage to the microwave's ceiling from prolonged exposure to the heat from the vent hole. Wearing oven mitts or kiln gloves, grasp both the top and bottom of the kiln at the same time, taking care to not open it as you lift it up (figure C). Place the kiln on a heat resistant surface, like a brick or tile.

Leave the kiln closed for 20–30 minutes before opening. For slightly larger work, increase the cooling time to 35–40 minutes. The top of the cover and bottom of the base stay very hot for a long time, so keep at least a 6-inch clearance above and around the kiln. After cooling, gently brush the fiber paper residue off of the base with a soft brush. **Note:** Wear a respirator to avoid inhaling the dust.

When using this kiln, follow the same rules as you would when firing work in a larger kiln. Clay objects can be fired either green or after a bisque firing. If firing green, the work must be thin and dry. Dry glazed work overnight before firing. Due to fumes, the microwave needs to be vented properly or fired outside.

Take careful notes. As the microwave kilns are too small to insert a pyrometer, and, unless you buy the larger model, also too small for a cone pack, you should take notes on the time/temperature correlation for your microwave.

TESTING, TESTING...

We tested the Spectrum multi pens (figure 1), a white gold and a mother-of-pearl luster, a purple overglaze enamel (figures 2–4), commercial underglazes (figure 5), an O4 transparent glaze (figure 6), and Egyptian paste (see "In the Mix" page 6). It took additional tests to find the correct firing time for the enamels and the lusters. The firings for the two overglazes produced noticeably more fumes and discoloration in the kiln than the other glaze firings.

As a general guideline, with a low-powered microwave, it took 3 minutes to fire a piece with luster or overglaze and 5 minutes to fire the glaze pens and underglazes. For clay bodies, two Egyptian pastes, fired green, a bisque-fired porcelain body, and a high-fired porcelain body. All of the clay bodies survived the thermal shock of the short firings (4 to 5 minutes for the Egyptian paste, and 5 minutes for the porcelain).

CONCLUSION

Though it won't replace your need for a larger kiln, a microwave kiln can help speed up your glaze and clay body testing, or provide a way to make small-scale objects or even models for larger pieces.

Microwave kilns are sold under three different brand names: MicroKiln, MagicFuse, and Fuseworks. Check with your local distributor for availability. All three can also be found online. ■

A special thank you to Spectrum Glazes (www.spectrumglazes.com) for providing a MicroKiln for use in testing clays and glazes for this article.

