

Portable Gas Raku Kiln

by George Juliano with Elizabeth Hudgins

A portable gas kiln was difficult to find within our budget, but the school needed one if my students and I were going to experiment with raku firing. I decided that the kiln had to be simple to operate, light, easily movable, safe and effective. After doing some research and shopping, I determined that I could build one that would meet all of my criteria for a lot less than I could possibly purchase one. So, with the help of the auto mechanics teacher at my school, I set out to build the kiln.

Process

Take a 55-gallon oil drum and clean it thoroughly with Varsol. Once it's completely clean and dry, use a reciprocating saw with a metal cutting blade, and cut the drum just above the second rib (about 24 inches from the base to the rim). Cutting above the rib provides extra strength and stability to the rim (figure 1).

Next, use the saw to cut a burner port 3 inches from the bottom, making a hole 3½ inches square (figure 2). This hole is where you'll direct the burner when you fire the kiln.



Finally, cut a 4-inch-square hole in the center of the lid and drill four ½-inch holes 2 inches from the center of each side of the square.

Bolt 3 metal “spider legs” to the drum lid, using 2 bolts for each leg (figure 3). Make legs from 2-inch-wide by ¼-inch-thick strips of metal, and bend them over the edge of the lid so that 3 inches remain on the top while 8 inches of metal hang over the edge. Set the metal strips at a slight

CAUTION

File all cut metal edges smooth to avoid injury.

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Fiber from fiber blankets can irritate the eyes, nose, throat, lungs and skin during installation and use. Always wear protective clothing and gloves, and use a respirator according to manufacturers' recommendations.

TIP

In addition to the legs, bolt 2 handles onto the lid about 3 inches from the edge so you can easily grab and lift the lid to remove raku pieces. Also, bolt 2 handles on the sides of the drum at a comfortable height for picking up and moving the kiln. This is important for taking the kiln inside between uses.



angle away from the vertical sides of the drum when you place the lid on the drum. The legs add some stability for the lid when it's in place, but they shouldn't get in the way of putting the lid on or taking it off. The major purpose of the legs is to hold the extremely hot lid off the ground when removing pots from the kiln. The legs allow air to flow under the lid, preventing it from destroying blacktop or grass.

To insulate the inside of the kiln, use 1-inch-thick fiber-insulating blanket, which is carried by most pottery supply stores (figure 4). Cut 2 circles, 1 to fit the lid and 1 to fit the bottom of the drum. Also cut a large rectangle so that the length measures the same as the circumference of the drum, and the width equals the height of the drum. Carefully place the fiber into the drum to make sure that it fits snugly with no gaps.



Be careful not to press on the fiber since compression of the fibers diminish the effectiveness of the insulation. Once you're certain of a snug fit, remove the fiber-blanket pieces and coat the inside of the drum and the underside of the lid with sodium silicate. Let that set for a couple of minutes, then gently push the fiber back in, again avoiding pressure so that the blanket remains fluffy. After the insulation is in place, carefully cut the fiber blanket out for the burner port and put the piece aside for later.

Cut small circles out of the fiber-blanket scrap you saved from the burner port hole. Place the circles over the bolt heads on the inside of the lid, using sodium silicate (figure 5). Set the finished kiln on three concrete blocks, one of which is located directly under the burner port. The blocks provide stability, keep the kiln off the ground and allow for a greater flow of air once the kiln is firing.

For the lid hole, carefully cut the fiber at an angle from corner to corner so that you can fold the triangles out and over the sides of the square



(figure 6). This enables you to cover the edge of the metal on the square so that there is insulation all around the hole. The insulation keeps the lid temperature down a little. Insert bolts through the lid from the inside through the four holes drilled earlier and through the triangular tabs. The bolts make it less likely that the fiber blanket on the lid will respond to gravity and fall off after a number of uses.

Take three shelf posts and a round shelf to make a platform for the pieces to be fired (figure 7). Place the three posts so that one of them is angled (with a corner facing the center of the burner port). Angling the post

NOTE

To provide the smoothest surface on the inside of the kiln, install all bolts with the head on the inside so the thread and nut are on the outside.

TIP

Since the propane tank tends to ice up when the kiln is firing, place the tank in a tub of water. This seems to keep the icing down a bit, making the flow of gas smoother and the firing more consistent.

disperses the flame to both sides for more even heat distribution. Place the shelf just above the burner port.

This portable kiln can be fired with propane or natural gas. I fire my kiln with propane, and I purchased a burner system. In addition, I picked up a 10-foot-long hose, a fitting for the connection between the hose and a propane tank, a propane tank such as those used for gas grills, a tub to put the propane tank in, a valve cock, and a pressure regulator (figure 8). Attach the pressure regulator to the hose and then the hose to the fitting for the propane tank.

Attach the other end of the hose to the valve cock and then to the burner (figure 9). Place another cement block in front of the one you placed under the burner port. Use this as the base for the burner.

To stabilize the burner, I cut a common building brick (with two holes in it) so that the brick could stand on one end, providing a nice U-shaped channel to lay the burner in (figure 10).

To add even more stability, brace 2 bricks against the burner to create an A-frame “tent” for it (figure 11). (I’ve been glad I did this. Several times someone has walked by and accidentally hit the hose, but the burner wasn’t dislodged, thanks to the channel and the A-frame security.) Place the burner head 1 inch from the burner port. This allows for oxygen to enter the kiln with the flame, making for a hotter fire in the kiln.

Finally, remove the top and bottom of an empty coffee can and place it on top of the lid to serve as a chimney for the kiln (figure 12).