

BUILD A SMALL WOOD DRYING KILN

by Bill Karow



Note: the lightbulb in the above image was replaced with a more energy-efficient ceramic infrared lamp bulb.

For a while now, I've been interested in creating a space to dry my roughed out bowl blanks, as well as a dust-free, climate-controlled environment where finishes could cure.

Researching on the web, I found a lot of great advice and instruction on how to convert full-size refrigerators, freezers and dishwashers, but since my shop is in my small garage behind my home, I simply don't have the room for something that large.

How I Found a Free Wine Cellar:

A couple months ago, I saw a post on NorthwestNeighbor.com from a neighbor who was looking to get rid of a wine refrigerator that was no longer working. He had purchased a new one and was eager to be rid of the original. As he happened to live less than a block away from me, I took my handtruck to his house, loaded it up and wheeled it back home.

Disassembly:

I stripped the cooler of everything that wasn't necessary to dry bowls. First, I took out the racks and saved them. They work great for supporting bowls while they are drying.

There were lots of screws and brackets holding the coils and motor that needed removing. I cut the coils and pulled everything off. There were only a few screws holding the plastic top onto the unit, so I unscrewed them, removed the top and set it aside for later remounting. I then stripped out all of the electronics, lighting fixture, circuit board and small wires that were underneath. Again, none of that was necessary for drying my bowls.

I then cut the power cord off as close to the unit as possible, leaving the plug attached, so that I could reuse it to attach to the lampholder in the outlet box. (More on that later.)

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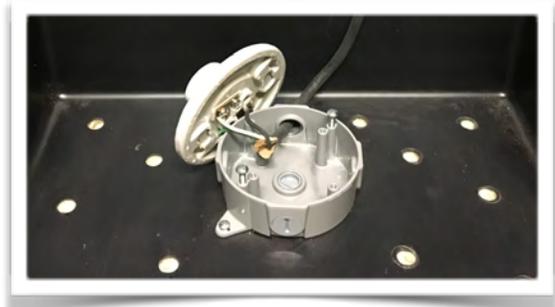
Drill the side vent holes as high up the sides as possible.

Ventilation:

Ventilation is important, as it serves to both dry the wood and carry the humidity out of the kiln. Since my kiln is small, I decided not to put a fan inside. Instead, I laid the unit on its back and drilled 12 holes through the bottom with a 1/2" bit.

On both sides near the top and back, I drilled holes with a 3" hole saw. This was so I could install adjustable butterfly vents on the sides to regulate the amount of air outflow. If you want to save a couple bucks, you could skip the fancy vents and the 3" holes, and just drill several 1/2" holes in both sides. Important: Make sure to drill the side vent holes as high up the sides as possible.

By doing so, I am trying to create a convective airflow. The heat from the bulb warms the air inside the kiln. That warm air rises, flowing up and over the drying wood, then exits out the side vent holes, taking moisture with it. Cool, dry air from outside the kiln constantly enters through the bottom holes to replace the warm, moist air that just left.



Run the powercord through one of the four holes into the outlet box, attach wires to lampholder, then screw closed.



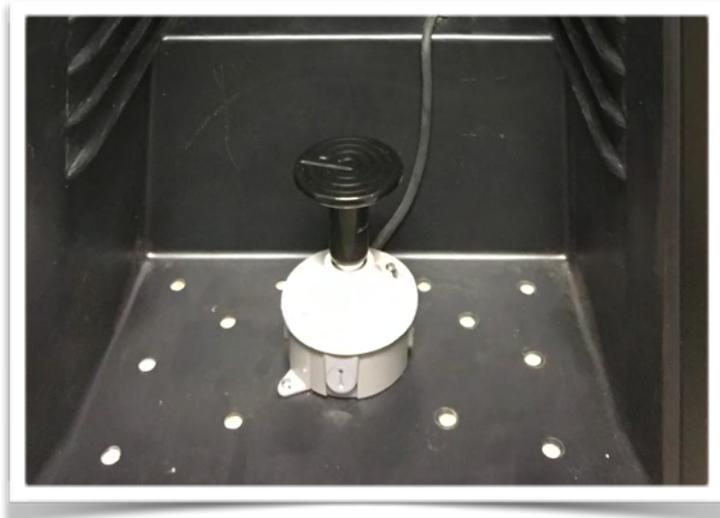
Run the powercord from the outside back through the existing hole with the white rubber grommet.

Wiring:

First, a caveat: Although this is a "simple" wiring connection, if you are at all uncomfortable doing this yourself, please have a professional electrician check your work, or do it for you.

That said, here's what I did: I used two screws to mount the wings of the outlet box to the floor of the cooler. Then, I fed the power cord (that I cut off earlier) through an existing hole on the outside back of the unit, behind the metal refrigeration plate on the interior back wall and down through one of the holes in the the outlet box. I stripped the wires and attached them to their corresponding mounts on the porcelain lampholder. Then I attached the lampholder to the outlet box with the existing, long screws. I attached weatherproof closure plugs into the three remaining openings on the side of the outlet box, as a precaution against moisture getting inside. I also used a couple of small plastic straps and screws to secure the powercord to the interior (optional, but it looks nice). I tested the connection by temporarily screwing in a light bulb and plugging the powercord into the wall socket. So far, so good!

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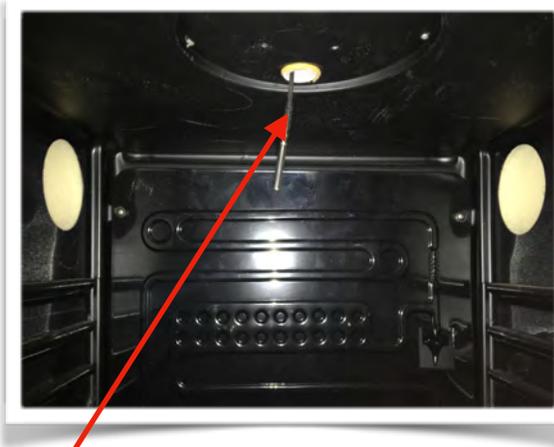
Ceramic Infrared Lamp Bulb – all heat, no light!

Heat Source:

Originally, I was planning to use an incandescent bulb to heat the kiln. Then I read somewhere about ceramic infrared lamp bulbs. They emit only heat and are primarily used to keep pet reptiles warm and hatch chicks. They last a lot longer than light bulbs, and since the kiln has a glass door, I don't need need to waste energy to light the inside.

Thermostat and Temperature/Humidity Monitor:

The thermostat is the brains of the operation. And at \$35 from Amazon Prime, it was the most expensive part of the kiln. But it is simple to set up, easy to adjust the temperature, and well worth the purchase price for the job it does. I ran the thermostat's small, attached sensor wire from the outside back, across the top and down through an existing hole where the interior light used to be before I took it out. I then reattached the plastic top that I removed earlier.



Thermostat sensor unit hangs down through hole in ceiling.



Run the thermostat's sensor wire from the back, underneath the plastic top and down into the interior.

Then I plugged the thermostat's power cord into the wall, plugged the heat lamp bulb's power cord

into the thermostat, set the temperature, and it kicked right on. I also attached a small magnetic temperature/humidity monitor to the front of one of the racks on the inside, so I could view the humidity reading without opening the glass door.

Parting Thoughts:

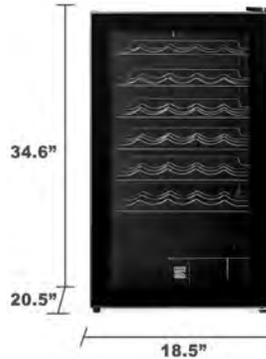
Now that I have a functioning kiln in my small shop, I am attempting to master the fine art of drying wood. (And probably will be for a long time.) Thanks for reading!

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INGREDIENTS:

Wine Cellar / Bottle Chiller / Refrigerator

Obviously, don't buy a new one and tear it apart. I suggest looking for cheap/used/free insulated coolers on Craigslist, Ebay, Nextdoor.com, appliance recycling centers, appliance repair shops, or even appliance stores (what happens to all the old ones when customers buy new ones?)



2x Stainless Steel Butterfly Vent With Side Knob

https://www.amazon.com/gp/product/B01EYHHTL2/ref=oh_aui_detailpage_o09_s00?ie=UTF8&psc=1

\$7.99 [x 2] (Amazon add-on)
[optional]



Digital Temperature Controller Outlet Thermostat

https://www.amazon.com/gp/product/B011296704/ref=oh_aui_detailpage_o07_s00?ie=UTF8&psc=1

\$35 (Amazon Prime)

Ceramic Infrared Heat Emitter Lamp Bulb

https://www.amazon.com/gp/product/B00HFNZ59Q/ref=oh_aui_detailpage_o09_s00?ie=UTF8&psc=1

\$9.99 (Amazon Prime)



Temperature and Humidity Monitor

https://www.amazon.com/gp/product/B01HDW58GS/ref=oh_aui_detailpage_o09_s00?ie=UTF8&psc=1

\$15.29 (Amazon Prime)



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INGREDIENTS:

Leviton Keyless Porcelain Lampholder

Leviton Keyless Porcelain Lampholder (49875-000)
Item no: 30845 | 078477819029

\$2.99 (Ace Hardware)



Round Weatherproof Outlet Box

Sigma 4-3/16" Gray Round Weatherproof
Outlet Box (143854)
Item no: 3424439 | 031857143855

\$7.99 (Ace Hardware)



Weatherproof Closure Plugs

Sigma Gray Weatherproof Closure Plugs 4/bag
Item no: 3425147 | 031857140076

\$2.49 (Ace Hardware)

TOOLS USED:

- Electric Drill
- Wire Strippers
- 1/2" Drill Bit
- Screwdriver (Phillips & Standard)
- Electrical Tape
- 3" Hole Saw (optional)
- Wire Cutters
- Pliers
- Sheet Metal Screws

If you do have space, here are some great sites to convert a full-size freezer into a wood drying kiln:

Cindy Drozda: www.cindydrozda.com/handouts_Pdfs/handouts/demo%20handouts/drying_kiln.pdf

Carl Jacobson: www.youtube.com/watch?v=u-vpg1iyB4c

Ted Rudie: www.rudieswoodwork.com/kiln.htm

Also, there are tons of discussions on home-built wood drying kilns of every shape and size on the **AAW** (www.aawforum.org) and **Sawmillcreek** (www.sawmillcreek.org) forums.