

# Build a Vacuum Form Table by Ralis Kahn



Front and side view of vacuum forming table made by "Ralis Kahn". (Note the corpse on the right side of the vacuum forming table....very nice touch!)

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## Materials

OK here goes. I built this vacuum form to make positives of faces to pre paint appliances and take them to set. So it is large enough to do a face and neck back to the ears.

### Materials:

Shop Vac (I have a craftsman 6.25 horse power)

shop vac hose to hose adapter

small rectangular electric grill \$23.00 at Walmart (it looks just like those little Sunbeam tabletop gas grills)

Heavy duty cookie sheet, mine is 18"x13&1/2"

19"x13&1/2"x1/4" thick piece of plastic or Plexiglas  
2 screen window frame kits  
1/2 a sheet (4'x4') of 1/2" particle board or plywood  
12' of 1/8" aluminum angle stock  
1 tube of silicone caulk  
assorted drywall screws & round head wood screws  
2 Light switches with plates I use the ones that you just touch the top or bottom not the old fashioned toggles  
Matching wall socket and plate  
some 14 gauge wire and wire nuts  
2 pieces of 1"x4"x13" wood  
(I built the machine out of what I had lying around so this is just a loose guide line for materials.)

## The way it works

Vacuum forming is simply heating up sheets of plastic until they are soft and stretchy then placing it over a positive form and using a vacuum to suck the plastic tightly onto the form. I have gotten very good detail with my machine, even pore texture from life casts! I had seen more elaborate machines with tanks, vacuum pumps, check valves etc. I just wanted to test the process and it worked so well that I have been using it ever since. In fact you may have seen pieces made on my machine on The tv show Angel and music videos on MTV.

[Well, let's get to it then](#)

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# Vacuum Form Table Construction



(This picture shows the bottom of the cookie sheet after it is installed.)

Take your cookie sheet and draw a grid of 1" squares, now drill a 1/16" hole at every intersecting line. Drill some pilot holes every 2" along the lip of the cookie sheet to mount it. Later you will be mounting the cookie sheet upside down onto the 1/4" plastic.

On the plastic sheet, cut a hole in the center that the vacuum hose adapter fits snugly into, but do not mount the adapter yet.

Build a box 12" high, 19" long and 13&1/2" wide with no top or bottom out of the plywood (just the four walls). Glue the hose adapter in the plastic with some Krazy glue. Make sure it is close to flush as you do not want the adapter sticking through the plastic more than 1/8" on the vacuum (top) and seal around it with caulk. With the adapter facing down place the plastic on top of the box, drill some pilot holes and screw it down.



Cut six little blocks; about 1/2"x3/4"x1/2" and glue them about 4" apart on top of the plastic with some caulk. These will be supports to help the cookie sheet maintain its shape under stress.

Place the cookie sheet upside down on the plastic, test fit, then glue it down with a liberal amount of caulking, then screw it down with the round head screws. you now have an air tight metal vacuum table that is only about 1/2" deep and very efficient.

Cut a mouse hole shaped opening [**see left side of picture above**] on the 13&1/2" side at the bottom of the box for the vacuum hose to pass through. The box is 12" high so that the hose will curve gently and not crimp.





The electric grill will be mounted upside down 2' over the vacuum table. just assemble the the heat shield and heating element on the grill; you will need some extra bolts to do this because you will not be using the legs. Bend the the heating element support inside out and mount it over the element, remember that the unit will be hanging up side down. You won't need any other parts of the grill.



Cut 4, 3' lengths of the angle stock and mount it on the corners of the box going straight up. The grill isn't 19" long so use the 2, 1"x4"x13" pieces of wood on the sides in between the grill and angle stock. Use the wood to mount the grill with bolts.



Make two identical frames from the screen window frame kits, they should fit over the raised part of the cookie sheet and inside the angle stock. This way the plastic will contact the raised edge of the cookie sheet forming a seal.

Remember to cut out a space for the power cord/temp controller in the wood on one side. Now open up the temp controller/ power cord and take out the thermostat, completely bypass it and rewire the cord direct. Close it back up. The temp control will cause it to shut off sometimes and you don't want that.





Mount the socket on the front (19" side) as well as the two light switches. Wire one switch to the grill and the other to the socket. Do a test. Turn on the grill. Then turn on you shop vac switch and plug it into the socket, then turn the socket switch on and viola the shop vac comes on.

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# Using Your Vacuum Form Table

Hook up the vacuum hose and cut a piece of plastic 18"x13 1/2" place it in between the two frames and clip them together with those big heavy duty black binder clips; 4 on the long sides and 2 on the short sides. Make sure that they are positioned so that they do not interfere with the plastic contacting the edge of the cookie sheet, it will take a bit of getting used to. Raise up the frames 1" under the grill and hold them in place with additional binder clips. Place your form on the vacuum table. Turn on the grill, the plastic will heat up and sag, when it has drooped about an inch to inch and a half it is ready. Remove the clips holding the frame up and drop them to the side; quickly and steadily lower the plastic onto the the form and apply moderate pressure to help from a seal. With your knee (or assistant) flip the the socket switch. The vacuum will suck down the plastic. After about 3 seconds, I turn off the grill and the shop vac will surge causing additional suction. While maintaining pressure, I leave the vacuum on for about 20 seconds so that the plastic cools a bit and does not lose it's shape.

Notes: I love my machine and have made teeth, eyes, faces, masks, underskulls, packaging, finger nails, hand forms etc. You can vacuum form many plastics, the easiest is styrene in thickness up to 1/4" I prefer .020 to .060 PETG is clear and flexible, ABS is what Fieros were made of and I used it to make Marilyn Manson's 16 foot tall gun cross for his world tour very strong stuff. Sometimes you will have to drill holes through your bucks for better detail.

Bucks are the positive forms that the plastic is formed over. You can use plaster, urethanes, epoxies, wood (sealed), silicone skins backed with rigid foam, or rigid foam skinned with thin vacuum formed plastic for your bucks. You will need to heat the plastic more or less depending upon the buck,. Watch out for undercuts, you can do a full head or skull just do it in two halves, make a mold of the front and back; cast up some bucks and go. You can make ABS armor that will be ten times as strong as the stuff that you can buy and it will be light. You will be amazed at what you can do. I will take some photos of my machine and attempt to post them ( I am pretty lame with this stuff) I hope that this makes sense, I am the kind of guy that just grabs stuff and builds.

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