

Case Mold Tutorial By Clone 6

Since Jim was good enough to add this little section, I thought that I would add a few thoughts on the subject.

Case molds, also known as Matrix **mold**, blanket **mold**, skin **mold**, etc. are simple a rubber **mold** that is supported by a ridged shell. You could simply pour a **mold** with solid RTV and have a fine **mold**. At \$100/gal for RTV, this makes for a very \$\$ **mold**. So if one could have a surface coat of RTV, backed up by a cheaper and more ridged material, it makes for a very economical product.

There are two schools of thought on this topic: 1) rubber first; **case** second. and 2) **case** first; rubber second. I am a believer in the second school for the reason that the **case** material, whether it be plaster or fiberglass, always shrinks more than the RTV. Therefore, it makes sense to create the **case** first and fill it with the rubber second.

This is done by creating a space for the RTV and building the shell over it. The space is made by protecting the model in a layer of saran wrap to protect it from the clay, and then covering it with a 1/2" of clay. Then the **case** is built over that. Once the **case** is done, the clay is removed, leaving a hollow space to be filled with the RTV.

This is better visualized with pictures

Start by mounting the model to a good solid surface such as a piece of 3/4" plywood. Don't go cheap here, whatever you mount it to must support the weight of the model, clay, being fiberglassed, or even plaster. In this **case**, I took some water clay and wrapped it in Saran Wrap. The clay will form a nice cradle to hold the model and the Saran Wrap will protect the model from getting the clay on it.



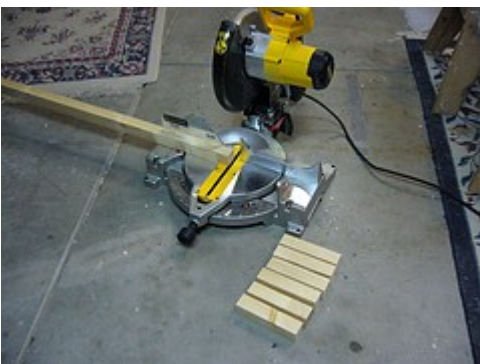
In order to get a good parting line from the Masonite, I use a square and a pen to mark the outline of the model. Simply go around the model with the square and mark the outer most points of the model.



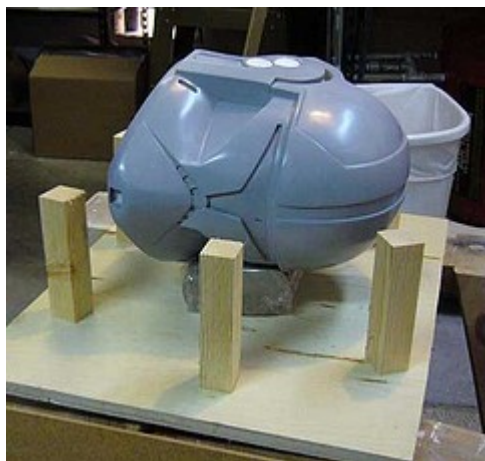
When you have made enough points to connect the dots you will have an outline of the model that can be cut out with a saber saw.



You will notice that the center line is level at 6.5". That is where the parting line will be. I use 1/4" masonite for the parting line, so subtract the 1/4" from the 6.5 and cut some uprights at 6.25"



Use a little hot glue and glue the uprights to the plywood



Mount the 1/4" masonite on top of the uprights



Now you have a good, solid parting line

Cover the model in Saran Wrap to protect it from the clay.



Slice up some 1/2" slabs of clay with a clay slicer. A clay slicer is simply a wire stretched between two carriage bolts. The thickness is adjusted by adding or subtracting nuts on the bolts. Two nuts is about 1/2". Add a few washers for thicker slices.



Here is the model covered with 1/2" of clay + a gasket edge. That is a lip that helps hold the rubber in the shell. The edges slope at 2-3 degrees to lock the rubber in. It also gives the rubber more of a mating surface when the **mold** is assembled.



You will notice two things here: the shiny surface is lacquer. The water clay **MUST** be sealed. Polyester resin that is used with the fiberglass **HATES** moisture. Give it 5-6 good coats of lacquer. Hell, 10 coats won't kill you. The second thing is the little plastic cup that is sitting upside down on the clay. I put that on the high spot to allow for a pour spout for the silicone RTV, to be added later.

Next, you need a **GOOD** coat of PVA for release for the fiberglass. I prefer to spray the PVA for an even coat, but it can also be brushed if you don't have a spray gun and air compressor.



Now you are ready for a fiberglass shell. Get two layers of 1.5 oz mat on and let set.



Here is a tip: If you wait until the resin gels (gets firm, but not completely hard) you can run a utility knife along the edge and trim a nice clean edge. If you wait until the fiberglass is completely hard, you will need to grind the edge with a belt sander to get a clean edge. GRINDING FIBERGLASS IS MISERABLE- AVOID AT ALL COSTS



After the first two layers have cured, add additional layers as needed. In this **case**, I added 3 more layers of 1.5 oz mat to get a 1/8" lay up. 1/8" is strong enough for a **mold** of this size. Large (heavier molds may require additional thickness.

Once gel-trimmed, and cured, you can flip it over and remove the Masonite, and repeat the clay/seal/PVA process for the other side.

Once you have both sides done



You should end up with everything encased in fiberglass like this.

You are now ready to open up the **case** and remove clay from one half or the other, it doesn't matter which, but not both. Once open, you have the model sitting in the clay half and you need to use a tool to smooth out your parting line in the clay. Sorry that I don't have a picture for this, but the cleaner your parting line, the smaller the flashing and easier the cleanup.



Once you have a nice clean edge tooled into the clay, add some keys so the rubber registers back into the same place each time. I use acrylic hemispheres, but you can also poke depressions into the clay with a drill bit. It works the same.

Back to the fiberglass shell - clean out any remaining clay and sand out any rough or gummy spots. (if the water based clay wasn't completely sealed from moisture, some of the fiberglass resin might have not completely cured - not a problem)

Be sure to drill 1/16" holes in all the high spots of the **case**. this is to let air escape as it fills up with the RTV.

Now you can add the RTV.

NOTE: If you save the clay from the **case**, you can pound it into a block and measure the dimensions. Why? Because the volume of the clay = the volume of RTV. This is where METRIC rules! Cubic centimeters = grams of RTV (approximately) At \$100/gallon, I don't like to waste any.



Do you see the tall funnel I have? This is because height = pressure. Fill the cone (keep it slender. A fat cone wastes RTV) with RTV and as it fills, it will bleed out the holes that you drilled in the **case**. Once they bleed out a little, plug the hole with a ball of clay. Add enough RTV so that the entire **case** fills and there is an inch or two left in the funnel.

NOTE: Be sure to check on the pour every once in a while until cured. If the unthinkable happens, and there is a blow out (or even a small leak) you will come back to the garage in the morning to find a VERY expensive **mold** of the floor.

Once cured for 24 hrs, remove the second half of the **case** and clean out the clay. Add a layer of Vaseline to the surface of the RTV and return the **case** (with the same 1/16" holes drilled for air) and pour the remaining RTV.

This should give you a good **case mold** that will produce many clean parts.

The only difference with a mandalorian helmet, is that the mando helmet is open on the bottom. Therefore, mounting the helmet upright and making the rubber one piece rather than two, makes it a little easier. You end up with a 'bucket' type of **mold**.

This brings up another point. If anyone was wondering why there are those two vertical pieces on the ends of the fiberglass lay-up, It is for a base that allows the **mold** to stand up on its own. It is not essential, but very handy (for a little extra work) to have your **mold** stand on its own. I would think that it would be essential on a mandolorian helmet **mold** if you are trying to lay fiberglass.

1. approx how much RTV did you use on this particular **mold**?
2. as far as doing this **mold** on an open on the bottom helmet...your saying I would mount it upright, go through all the steps shown with the clay and laquer, keeping it all one piece. Would I then have go back to horizontal and do the hard fiberglass shell in 2 pieces with the divider?

I would guess 2 gallons. I guess because I don't remember. I also had to do it in multiple pours due to my scale only going to 2600g.

Somewhere in my instruction above, I mention that if you measure the clay, you can compute the volume of silicone. All the clay from one half was formed into a 6" cube. Unfortunately, I don't have a metric ruler, but if you convert 6' = 15.24cm. So a 15.24 cube = 3540 cc.

Yes, one piece rubber, two piece shell. Mind you, that the bottom of the **mold** would be the bottom helmet. You would have to trim you helmet right at the edge of the **mold** to get the bottom of your helmet.

Are your helmet castings going to be fiberglass or resin? It would make a difference in how to approach the **mold**.

I personally, would make a fiberglass **mold**. The mando helmet doesn't really have a lot of detail or undercuts to it. Why use silicone at all?