Two More Tricks for Mold Making

By David E. Parvin, A.L.I.

Recently, I was going to do something that seemed routine enough, but as I thought about it, it presented an opportunity to look for *a better way*. I needed to make a mold of a one and one half life size bayonet which is part of a commission that sculptors Bill Hueg and Elliot Summons along with myself are executing for a suburb of Denver, CO. Either of the two common methods of mold construction would have worked. I could have covered the bayonet with several layers of thixotropic rubber and then constructed the mother mold. Or I could have make the mother mold first and then filled the space between the mother mold with a pourable rubber. Of the two, the first would have been simpler and quicker to construct and in this case the one I would have preferred. But even thixotropic rubber tends to run off sharp and/or pointy parts making it difficult to get a smooth and uniformly thick application of rubber. The second method solves the problem but would have taken longer. The additional time would have been well spent if the plan were to use the mold for a large edition, but this particular mold was slated for use only four times. (See "How to Make a Great Mold" *Sculpture Journal, Nov. & Dec. 2006 and Jan. 2007,* by yours truly.) So I got to thinking, a risky endeavor since a mind is a terrible thing, that there just might be a better way.

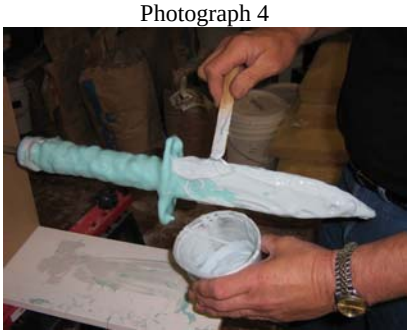
Photograph 1

Photograph 2

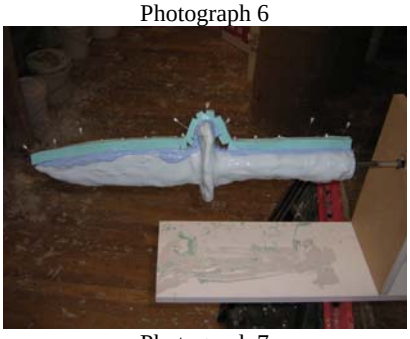
"Let's see," thought I, "a common method for applying an even layer of material to the inside of a mold is to spin the mold. Why not do something similar but with the material on the outside... Obviously, the speed of rotation would have to be pretty slow or the rubber would be slung off, yet not so slow that the rubber would drip off. Is there anything that I could purchase at a reasonable cost that would turn the bayonet just at the right speed; hmmmmmm? How about a rotisserie... Yea, I could purchase a 100,000 b.t.u. stainless steel barbecue grill and take off the rotisserie mechanism!" Well as it turns out, life just gets better and better; my closest mega hardware/home improvement center carries an assortment of rotisserie motors completely unattached from any grills. I purchased one along with a 6X8X3/4" piece of fiber board, two metal elbows, and some screws. I mounted the motor and the rotating shaft as in photograph #1. Photograph #2 shows the bayonet attached onto the pointed end of the rotating shaft. The speed of rotation is about eight r.p.m.


Photograph 3


Photograph 4


Photograph 5


Photograph 6


Photograph 7

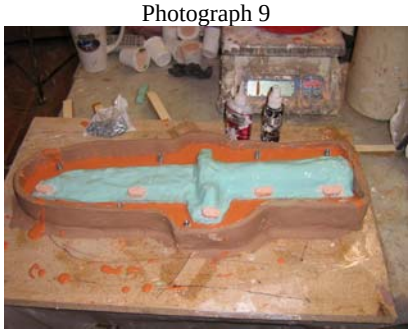
There are two points of possible interest, “popis,” in photograph #2. First, the bayonet was designed with a computer and the data was emailed to a company which milled in foam the one and one half life size model shown. Once we received the foam model, it was covered with a thin skin of clay and textured to conform to the project. I have to admit that I am amazed that it is now possible to sculpt on a computer screen. I would explain exactly how this was done in but I haven’t a clue, Elliot Summons did it. The second popi is that by using the full length of the rotating shaft, one could have place some charcoal under the rotating shaft between the vertical supports and barbecued some brats or a chicken while the rubber cured!

In photograph #3, technically gifted Elliot was applying the first layer of rubber which was a tin cured silicone with a non thixotropic activator. The rubber was de-aired in a vacuum chamber as was all rubber used in this article. While de-airing is optional, it does reduce air bubbles. This first layer of rubber was applied at the end of a day and allowed to rotate and cure overnight. The result was as seen in photo #4. There is no doubt that the rubber was both more uniformly thick and smoother than if the bayonet had not been turning. In photograph #5, I was applying the second layer of rubber which was the same as the first layer except I used an activator with a thixotropic additive and along with an accelerant allowed for a thicker second coat and a reduced cure time.

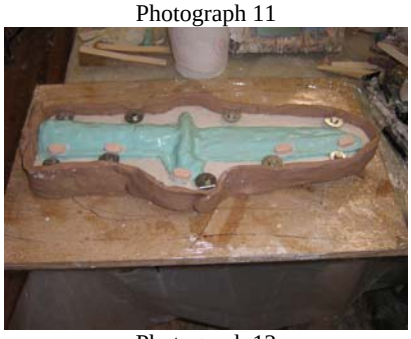
At that point, the combined layers of rubber were probably about 1/8” (.4 cm.) thick, not thick enough for an effective parting line. Fortunately, my mega home improvement/hardware center also carries aluminum extrusions. I bought a piece that was “U” shaped 3/4” wide by 1/2” deep (about 1.8X1.2 cms.) and poured a strip of rubber the length of the bayonet. (Photograph #6) As soon as the rubber strip had cured enough to hold its shape, I “glued” it to the top edge of the bayonet with some rubber and used hat pins to assure that it stayed in place until the rubber had set up. (Photograph #7) Note that there were


Photograph 8


Photograph 9


Photograph 10


Photograph 11


Photograph 12

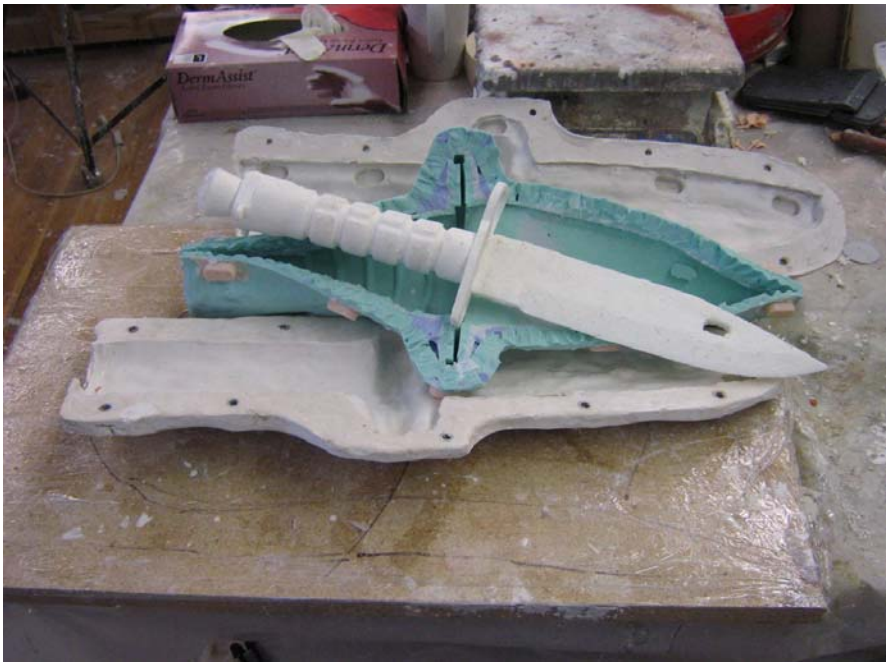
some places where the rubber strip didn't fit snugly to the rubber layers. This was not a problem because the third an final coat of rubber would fill these in. For this last layer I did not use a thixotropic activator because I wanted it to have as smooth a surface as possible. Once the final coat had cured enough to no longer drip, rubber keys made from pill trays were pinned along both sides again using rubber as glue. This brings us to photograph #8. You may notice that I have attached a couple of rubber bands. Well, I, not being as graceful and spatially aware as I once was, bumped into the bayonet which, made of foam, broke at the base of the blade causing it to sag. The rubber bands held the blade in place until the rubber had completely cured.

The making of the mother mold was very straight foreword except for one little trick that I want to share. In photograph #9, I had positioned the bayonet level and surrounded it with a clay wall. The simplest way to construct the mother mold would have been to fill in the clayed area with plaster, hydrocal, resin, Forton MG, or some other material of choice. Once set up, apply a release agent and cover the exposed material. To assure that the sides of the mother mold always align properly, drill some holes through the mother mold outside of the rubber and use bolts to join the two sides. Or one could just use rubber bands or clamps or straps to join them. However, I would rather take a few extra minutes and make something just a little neater.

My second new trick was to pour in alginate to the mid line of the rubber covered bayonet. I had mixed the alginate to be a little runny (one part alginate to 4 parts water using "Regular Set" by Artmolds) so that the alginate would be level and with a smooth surface. Once set up, I used cyanoacrylate and "Insta Set" to attach threaded metal inserts to the alginate. (Photograph #10) My mother mold material of choice by far is Forton MG. Then I painted in about a 1/8" (.3 cms) layer of plain Forton MG to assure a very smooth inside surface of the mother mold and more firmly attach the metal inserts. After this first layer of Forton MG had set up, I screwed bolts into the open ends of the inserts to keep from filling them with the Forton MG. Next I painted on two more layers of Forton MG, the first with chopped fiberglass for strength and the second plain for a smooth surface on the outside of the mother mold. (Photograph #11) Within 30 minutes, I was able to unscrew the bolts, turn over the mold, remove the alginate, apply some petroleum jelly to the exposed surface of the Forton MG as a release, and having glued washers to them, screw the bolts in from the other end of the inserts. (Photograph #12) Repeating the layers of Forton MG being careful to cover the edges of the washers, both side of the mother mold were finished.

There are two things that I accomplished by this slightly more complex way of constructing the mother mold. The first was to assure that the two sides of the mother mold will fit back together only perfectly. Also, I don't like parts such as washers coming off when a mold is opened. This way, only the bolts are removed. For a more thorough explanation, see the three *Sculpture Journal* articles mentioned in the first paragraph of this article. By the way, as described in the three articles, the two sides of the mother mold were constructed using metal shims. But in this case it would have been difficult to attach shims to the edges of the rubber especially along the side opposite the parting line.

All that remained to be done was to take the mold apart and make a zipper cut for a parting line. Photograph #13 shows the disassembled mother mold and the first casting made in it which is a urethane replica of the bayonet. Almost everyone who seen this in my studio has picked it up and played Crocodile Dundee, "Now, Mate, **this** is a knife!"



Photograph 13