

# Great Mold Part II

David E. Parvin, A.L.I.

When I began writing on this subject, I thought that it would take two articles. But as it turns out, it will take three. It isn't that it is so difficult but rather that there are many small steps that need to be explained. While this may seem unnecessarily complicated and lengthy, the resulting flawless castings will make it all worthwhile. In "Great Mold Part I," *SJ*, Nov. 2006, I explained attaching the model to the base, covering the model with clay, and was almost finished with building the mother mold. In this article, I will complete the mother mold. Next month, I will pour in the rubber, finish the mold, and put the mold to use.

## Building the Mother Mold

At the end of last month's article, I was almost ready to spread on what would become one side of the mother mold. The only thing remaining was to apply a mold release. A great release is a solution of 15 parts by weight of petroleum jelly to 100 parts naphtha. The petroleum jelly doesn't dissolve very quickly and I would suggest mixing the two at least a day before needed. Applied with a soft paint brush, the naphtha will quickly dissolve leaving a thin, even layer of petroleum jelly. This will not only facilitate separating this first side of the mother mold from the clay and shim but will also smooth out the clay. I learned of this release solution from Michael Sisbarro who is another contributing writer to *Sculpture Journal* and have found it to be an excellent all around release agent and I always keep some made up.

The next thing was to decide on a material for the mother mold and there are lots of choices such as

plaster, FGR-95 Hydrocal, polyester and polyurethane resins, fiber glass, epoxy, and Forton MG. I prefer the latter because Forton MG is easy to use, odorless, water soluble, inexpensive, and very strong allowing for thin molds that are light in weight. (For more information on Forton MG,



Photograph #13



Photograph #14



Photograph #15



Photograph #16

see my article, "Mixing Forton MG Simplified," *SJ*, July 2003.) But applying the material over the clay is done approximately the same way regardless of which is used. Since all of these materials are liquid, all are applied in layers. But Forton

MG is especially ideal for layered applications. Other materials require you to mix a batch, apply it, let it thicken, then mix another batch and repeat until you have a sufficient thickness. Forton MG is so much easier because you can mix the entire amount that you think you will need, dump just enough for one layer into a separate container, add an accelerant which will cause just the separated amount to set up quickly, apply, and then repeat with the next layer. The accelerant is a solution of 10 parts aluminum sulfate to 100 parts water. Aluminum sulfate is a fertilizer available anywhere that sells gardening supplies, and, compared to many of the products that we artists use, is cheap. A tablespoon of accelerant to a pint of Forton MG will cause it to solidify in about 10 minutes. The amount of isn't critical, just be aware that the more you use, the faster the reaction. In photograph #13, I am painting a coat of plain Forton MG over the clay and the metal shim. Next, not shown, two thin coats containing chopped fiberglass fibers were added. In photograph #14 assistant Morgan is finishing up with a final layer of plain Forton MG to give the outside of the mold a smooth finish. As soon as the last layer of Forton MG has set up, give it about 30 minutes, it is time to repeat the process for the other side.

The thickness of the mother mold will depend on what it is made of. With most of the materials mentioned above, including Forton MG but not plaster, no more than 1/4 inch (about 1/2 cm.) is sufficient. Be sure to bury the threaded metal inserts up to their tops. Don't worry if the tops get covered, the clay that was pushed into the ends should keep the threads clean.

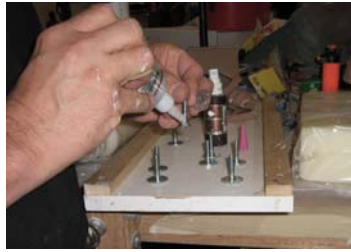
In photograph #15, I am removing the metal shim. Notice the ends of the threaded metal inserts and the small indentations from the plastic "feet." These indentations will assure that the two sides of the mold align perfectly so that the bolts will fit easily and properly into the inserts. Also notice that the clay dam that had

surrounded the metal shim to contain the liquid Forton MG has been removed and will have to be reinstalled for the same purpose for side number two.

The next step is a small thing and optional but it makes taking the mold apart and assembling it more convenient. I'm going to imbed fender washers into the second side of the mold which will help distribute the pressure of the tightened bolts to the Forton MG and also prevent the washers from falling off whenever the mold is disassembled. In photograph #16, I am crimping or roughing up the edges of a washer with a pair of side cutters so that the Forton MG will more securely anchor it in place. In photograph # 17, I have taken the bolts that will hold the two sides of the mother mold and stood them vertically, heads down. With a drop of super glue, I am attaching the washers to the bolts. (Keep reading, this will make sense in a minute.)

There are five things to note in photograph #18. First, notice that two of the bolts and washers have been inserted into the threaded inserts. The washers were screwed down only within about 1/4 inch (1/2 cm) of the first side of the mother mold where they stay suspended in place because of the glue. This will allow for the subsequent Forton MG to go under the washers as well as over their edges to anchor them in place and prevent them from falling off every time the mold is taken apart. Next, if some Forton MG did manage to get inside and clog up the treads of any of the inserts, a 1/4X20 tap, as I am demonstrating, will clean out any Forton MG and/or clay. In order to position the washers at the right height, the bolts may need to extend beyond the outside edge of the metal inserts which may have been covered with a layer of Forton MG. Screwing in a bolt or a tap should break right through as long as the Forton MG is thin. If, however, you inadvertently covered an insert with a thick layer of Forton MG, drill through the center of the insert out through the Forton MG with a 13/64 inch drill bit prior to inserting a bolt or tap. Do not use a 1/4 inch bit since it would destroy the threads.

Third, the clay that is next to the tap in my hand will be the entry channel for the rubber once both sides of the mother mold are completed and the



Photograph #17



Photograph #18



Photograph #19



Photograph #20



Photograph #21

clay has been removed. Add more clay here so that this side looks as it did for the first side in photograph #11 in last month's article. The eventual channel should be no less than 3/4 inch (2 cms) in diameter.

Fourth, as you can see, I have rebuilt the clay dam that goes around the outside of the mold. Just as for side one, the dam will contain the liquid Forton MG as the layers are applied.

One of the really great properties of Forton MG is that, unlike other gypsum products, new material added to old (set up) bonds beautifully. But, since it is essential that the new side of the mother mold not stick to the first, a release is necessary. I applied the naphtha nd petroleum jelly solution as explained above. However, as added insurance, I spread a little more petroleum jelly on the Forton MG.

In photograph #19, one of my assistants is spreading on the second layer of Forton MG which, as will the third layer, contains shredded fiberglass. The first layer was plain Forton MG to assure a smooth surface on the inside of the mother mold. The fourth and final layer also will be plain for a smooth outside surface. If you look carefully, you can see that the heads of the bolts have been surrounded with small rings of clay. These rings make it easy to bury the washers without locking in the bolts. Once the Forton MG has set up, the clay can be easily scraped out exposing the sides of the bolt heads for easy fitting of a socket or nut driver. Also important is that the two threaded metal inserts that were bolted to the wood base are being completely covered.

Photograph #20 shows the completed second side of the mother mold. I had just removed the clay dam and was trimming any rough edges with a box cutter. Another reason I like Forton MG is that on the same day that it is cast, it can be easily worked with a knife. Let it cure for a couple of days, however, and it is so hard that one would need a grinder, file, or belt sander.

Once the bolts have been removed (don't forget the four through the wooden base), with just a little gentle encouragement, the two sides of the mother mold should separate as in photographs #21 and #22. It is important that the model remain in a fixed position relative to the base and mother mold to insure that the rubber will be the desired thickness so do not disconnect the model from the base. Please notice that I am wearing a "T" shirt that advertises the ISBN number

of my instructional video on casting the female torso; not quite subliminal but shameless none the less.

Removing the clay shouldn't be difficult. If a little scraping is necessary, use something that will not scratch the inside of the mother mold since the Forton MG is still new. A plastic spoon works well. Collect the removed clay; its weight will provide away of estimating how much rubber is required. More on this below. The easiest way to get the last of the clay out is to use a brush with hot water and detergent. In photograph #23, my assistant, Audra, is using some 220 grit sandpaper to make the inside of the clean mother mold even smoother. (Audra has a rather board look on her face as if reassuring herself that she is still better off than working in fast food. The other possibility is that she is ignoring fellow sculptor Elliott Summons who is behind her watching her through a glass ball.)

Before reattaching the sides of the mother mold to the base and each other, coat both the model and the insides of the each half of the mother mold with the naphtha and petroleum jelly or some other mold release of your choice. A mold release is **essential** if urethane rubber is used since urethane rubbers bond to almost anything. For silicones, a release isn't an absolute requirement but will allow the mold to be more easily disassembled after the rubber has cured. More on rubbers later. To insure that the rubber doesn't leak out the seams of the mother mold, spread a little additional petroleum jelly on the inside of the flanges and where the mother mold touches the base.

Photograph #24 shows the mother mold after the clay was removed and one side has been reattached to the base. In the next photograph, #25, I have positioned the other half of the mother mold, secured it to the base with two bolts, and am bolting the two halves together. The next step will be to pour in the rubber. But first there are two questions that need answered, which rubber and how much. Those questions along with the final simple (I promise) steps in finishing up I'll cover next month.



Photograph #22



Photograph #23



Photograph #24



Photograph #25

---

---

David Parvin is a Denver sculptor. He may be reached at 303-321-1074 if you would like to discuss art, fly fishing, flying, or grandchildren.

---

---

Sculpture Journal December 2006