

MAKING MORE THAN ONE

BY: RON MORSE, MMR

Do you have some detail part that you only have one of and wish you had more? Would you like to have piles of junk but can't afford to pay 50 cents or more for each casting? If your answer is yes, then I think I have a simple, low cost way that you can make scads of low cost detail castings for your modeling use.

Ethics - A few years ago an outfit in California "pirated" about 50% of our Morse Productions line of castings and sold them under a different name without our permission. **Not only is that ethically wrong it is also illegal!** On the other hand making a copy of a commercial casting for you own use is a horse of a slightly different color. Personally I do not see a problem with this as long as you use these "copied" castings for your own use and you do **NOT** market them...**or** make them for others (even if you give them away for free). With that in mind let us consider some ways you can make duplicate castings of items you, or someone else, has created.

If you would like a printable copy of the notes from this clinic please email me at: rdmorse1@juno.com



The inexpensive, "quick and dirty method" - USING (NON-HARDENING) MODELING CLAY AS THE MOLD AND PLASTER FOR THE CASTING

The real advantage of the plaster is that once you have your casting you can easily clean it up or modify it by using an X-Acto knife or a small nail file. Once your casting has dried you can paint or weather it as you see fit.

First, you must understand that this process will **NOT** work on ALL items. Specifically items that are either very small or that have a lot of under cuts or that require a two or more piece mold. However, this process DOES work on items that do not have a great deal of undercut and that have one unfinished face (side).

Next you need some modeling clay. This can be bought at places like K-Mart or arts and crafts stores. This is the type of clay that is oil based and is non-hardening.

We use the Perm-O-Plast® brand but any other non-hardening clay will work. You will find that the clay comes in a variety of colors, but it really doesn't matter which color you select.

The clay usually comes in a rectangular bar shape that is wrapped in clear cellophane. Remove the cellophane wrapper and place the clay on a scrap piece of board or Masonite® to serve as the base. Usually the rectangular shape of the clay as it comes out of the box is an ideal shape for your project. If you are using some clay that is not in a nice cubical shape you will need to work it until you have a very flat level surface that you can use for making impressions of your masters.

Generally it is best if your clay is at room temperature. If it is too cold it will be hard to push the parts to be duplicated down into the clay. If it is too warm the clay may stick to the master when you pull it out. If the clay is either too warm or too cold either warm it in the microwave (usually 15 seconds or less) or put it in the freezer accordingly.

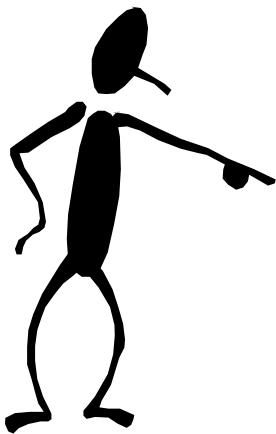
Now that you have your clay ready, simply take the piece you want to duplicate and slowly and carefully push it down into the clay to the desired depth. Then, slowly and carefully pull the master back out of the clay. This process works best when duplicating items that do not have a lot of undercuts. If the master is one that will be awkward to pull back out of the clay you may want to glue it to a small handle made from wood or a nail. We will deal with more complex castings later. For example, if you wanted to duplicate car tires and/or wheels these would work great. Depending upon the size of your piece of clay, make a number of impressions of the parts you want to duplicate. Leave about 1/2" between each impression so that one impression does not distort the one next to it.

After you have made the desired impressions in your clay you are ready for the next step. We generally use Plaster of Paris as our casting medium because it is easy to carve, cheap and easy to come by. Basically you can use any of the plasters, epoxies or casting resins as your casting medium. The nemesis of plaster is keeping air bubbles out. There are several ways to control these. The easiest way is to use ordinary dish detergent in water at a ratio of 5-10 drops of dish detergent to 1 pint of water and liberally spray this into the mold before you pour the plaster in. Another approach is to use a product called "Airid" which is made specifically for this purpose. Some of the specialty craft or plaster figurine stores handle this product or it can be ordered direct from the manufacturer. Once again liberally spray the Airid into the clay mold just prior to pouring the plaster. Mix your plaster to the consistency of a tomato soup so that it will easily flow into any cracks and crevices. Next carefully lift the clay master about 1 to 2 inches above the table and drop it squarely back down on the table. Do this 5 to 10 times. This action forces the plaster down into the mold and brings the air bubbles to the top. It will take some practice at doing this so you don't distort the mold or hit it unevenly and cause the plaster to fly out of the mold and into your face. We recommend safety glasses be worn during this procedure. Next take either a scrap piece of

plastic, wood or a palette knife and trowel off the excess plaster from the top of the mold (or place a piece of Plexiglas down onto the clay mold and allow it to remain undisturbed until the plaster sets). Allow the plaster to sit undisturbed until it has set. We usually allow at least an hour but times will vary depending upon the type of plaster you are using and its age. A good rule to remember is leaving the plaster for a longer period of time is better than trying to pull your casting too soon.

After your plaster has set you can carefully remove your casting from the mold. Depending upon the shape of the casting and the care with which you remove it you may be able to get more than one pour from your mold. Once the mold becomes distorted to use or you want to make something different simply remove any excess plaster flash that may remain on the mold, heat for about 5 to 15 seconds in your microwave, knead the clay until soft, and reshape it and using a flat board press it into another flat surface and you are ready to start all over.

For larger more complex parts such as car bodies for a junkyard we start out with a master that we want to duplicate and wrap it with a piece of clay pressing the clay into all the cracks and crevices. This clay wrap is clay that has been rolled out until it is about 1/8 inch thick. Carefully pull back the clay enough to release the master and then slowly press the clay back into the shape it had when it was wrapped around the master. Follow the steps detailed earlier on making a plaster casting. NOTE: I used modeling clay for my rock mold for years before I went to using latex.



MAKING LATEX RUBBER MOLDS

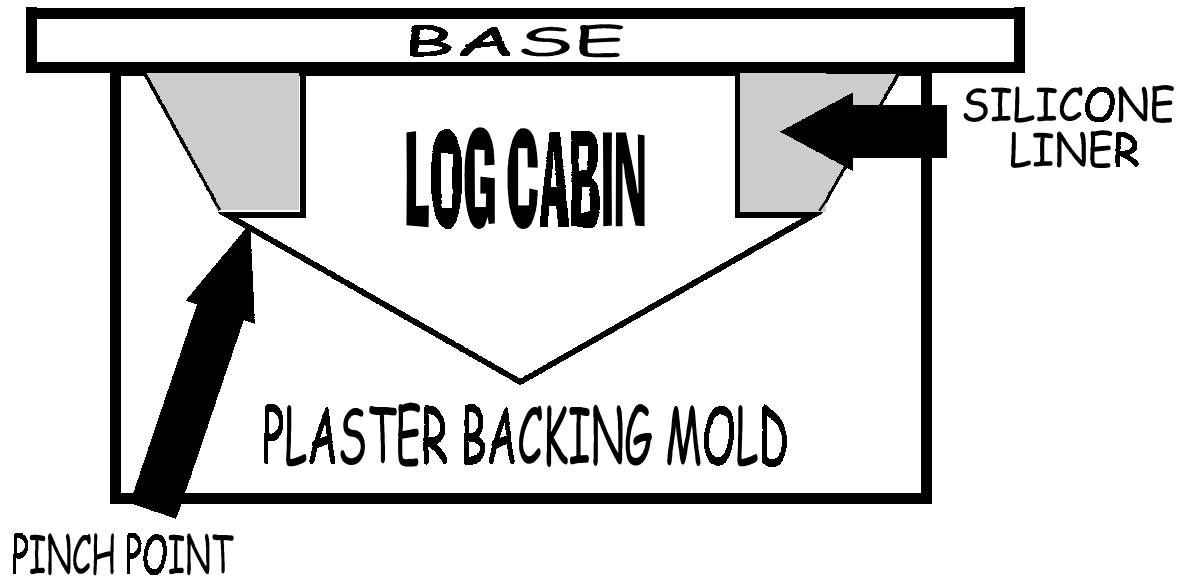
There are several brands of latex rubber available. The one that is most readily available is "MOLD BUILDER LIQUID LATEX RUBBER" which you can purchase at "Michael's" or "Hobby Lobby". It is generally sold in a 16 ounce container which you will be hard pressed to use up. Here are some general guidelines for working with latex molds:

- Latex can be used on models made of metal clay, plaster, wood, plastic or glass. **Brass or copper MUST first be coated with shellac or acrylic lacquer**, or it will interact with the latex and ruin the mold.
- Generally latex molds are used for casting plaster items.
- Your first coat of "Mold Builder" Latex is the **MOST** critical. This is the coat that will

capture all the details. The additional coats are only used to strengthen the mold.

- Avoid a build up of material in crevices and corners. I use a small watercolor paintbrush.
- Be sure all air bubbles are popped.
- Brush latex "Mold Builder" in a continuous film onto work surface.
- Create an apron or flange around the base of the model. This flange will support the mold during the casting process. Allow each coat to dry to a translucent color before adding an additional coat. We usually apply 8-10 light coats of material. Putting gauze in the flange (between the layers of latex) will help reduce the possibility of tearing the mold.
- NOTE: Rock molds do not require a flange.
- Use "Armor All" or spray silicone to keep the mold from sticking to itself. Allow the mold to cure for a minimum of 24 hours after the last coat of latex has been applied before using the mold (72 hours is better).
- If you are going to use the mold many times, boil it in boiling water for 25 minutes to "Vulcanize" the latex. Allow the mold to dry overnight before using.
- Clean your paintbrush with An ammonia based window cleaner.
- Masters and molds with heavy pinch points will need a backing mold (usually made from plaster) with a removable silicone liner. In the diagram below we are looking at the backing mold and silicone liner for a LOG CABIN. Note: The roof has a very large "Pinch Point".
- We use silicone caulk for the liners. To keep the caulk from sticking to the latex we first coat the latex with Vaseline. NOTE: Heavy buildups of caulk may take WEEKS to cure!!! Trying to remove the liner before the caulk has cured may distort the liner.

USING A BACKING MOLD ON LATEX RUBBER MOLDS



PAINTED CASTING ->



USING ONE-TO-ONE/RAPID LIQUID SILICONE RUBBER FOR MAKING MOLDS.



- This material is available through Micro-Mark: www.micromark.com
- MOLD RELEASE is required for this product.
- For additional information about casting with this product please see an article I did for Model Railroader Magazine in February of 2003 "Modeling Stone Walls" (pages 92-95).

POSITIVE NOTES:

- A 32 ounce kit sells for \$27.50.
- Has a 30 minute pot life with a 24 hour cure time.
- Best when used for flat work (i.e. stone retaining walls, tunnel portals)
- With this material you can easily make two part molds.
- This material can be used to cast plaster, resins and low temp metals.

METAL CASTINGS:

- If you want to cast with metal you can use TYPE 160 (degrees) metal. Melts with a candle flame or on your kitchen stove.
- If you want to cast with metal you can use TYPE 280 (degrees) metal. Melts with a butane torch.)
- When pouring molten metal into an open face mold I immediately press a piece of smooth Masonite® onto the surface of the mold to squeeze out the excess liquid metal.
- One advantage to metal is if your casting does not come out perfect you can simply re-melt the metal and try again and again until you are satisfied with your final product.
- **BE SURE TO WEAR SAFETY GLASSES WHEN POURING HOT METAL.**

RESIN CASTING:

- I had some Envirotex on hand that is normally used to create water in model railroad scenes. I coated my RTV mold with mold release and poured a round of dog houses and a mine car from the Envirotex and they came out fine. The fact that they are clear makes the detail a little hard to see but once they are painted they are fine. You can add colors (made for resins) and some resins are a milky white opaque color to begin with.

RTV CASTING:

- Conversely I poured some RTV into a latex mold of a "Timber Crock" and it came out fine (it created a rubber "Timber Crock"...not sure if you can paint it?). I'm not sure what the application for this is. But maybe you can find one!

EPOXY CASTING:

- If you do not want to purchase some resin for casting try using Epoxy (I recommend using a 24 hour cure time epoxy as it will give you time to work the bubbles out before it sets). Be sure to use a mold release.

DRAWBACKS:

- Tends to tear easily.
- They make a TEN-to-ONE which is supposed to have a HIGH TEAR STRENGTH (I have not used it).

PLASTER TYPES

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TYPE OF PLASTER	*CONSISTENCY	SETTING TIME	NATURE
PLASTER OF PARIS AND #1 MOLDING PLASTER	67 - 80	6 - 9 MINUTES	CHIPS & CARVES EASILY
HYDROCAL A-11	45 - 55	20 MINUTES	DOES NOT CARVE OR CHIP EASILY. (WHITE IN COLOR) LONG PERIOD OF PLASTICITY.
HYDROCAL B-11	50	25-30 MINUTES	DOES NOT CARVE OR CHIP EASILY. (GRAY IN COLOR) LONG PERIOD OF PLASTICITY.
ULTRACAL 30 & 60	37 - 38	25 - 30 MINUTES	DOES NOT CARVE OR CHIP EASILY. (WHITE IN COLOR) LONG PERIOD OF PLASTICITY.
HYDROSTONE	32 - 40	15 - 25 MINUTES	CANNOT BE WORKED IN PLASTIC STATE.

*CONSISTENCY TELLS YOU THE WATER-TO-PLASTER RATIO AND THE HARDNESS OF YOUR PLASTER.

CONSISTENCY (HARDNESS) RANGES

94-77	SOFT TO MEDIUM
76-59	MEDIUM TO HARD
58 OR LESS	EXTRA HARD

BOTH PLASTER AND WATER ARE MEASURED BY WEIGHT NOT VOLUME.

USE THE ABOVE CONSISTENCY NUMBERS TO DETERMINE MIX RATIOS. FOR EXAMPLE:

A CONSISTENCY RATIO OF 67 MEANS YOU WOULD USE A RATIO OF 67 POUNDS OF WATER TO 100 POUNDS OF PLASTER OR 1 POUND OF WATER TO 1½ POUNDS OF PLASTER, OR A 2:3 RATIO.

Purchase Plaster from:
Evans Building Material Company
210 W. 74th Terrace
Kansas City, MO 64114
Phone: 816-523-4050

WORKING WITH PLASTER

- GENERAL GUIDELINES -

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1. Always add plaster to water (**never add water to plaster**).
2. The setting time of plaster is affected by several factors:
 - A. Water to plaster ratio (more water equals longer setup time).
 - B. Water temperature - The hotter the water the faster the setup time (room temperature is recommended).
 - C. Speed and duration of mixing (fast mixing and/or long mixing time produces a faster setting time).
3. Plaster should be stored in a dry atmosphere.
4. The age of plaster is also a factor in setup time (the older the plaster the longer the set up time).
5. MIXING AND POURING:
 - A. Water is put into the mixing container.
 - B. Plaster is sifted into the water at a rapid rate.
 - C. This plaster-water combination is allowed to sit undisturbed for 1 to 3 minutes, this is called "SLAKING".
 - D. This combination is then mixed (usually with a spoon or spatula).
 - E. The agitation is then stopped and the mix poured.
 - F. Any excess plaster is thrown into a trash container.
 - G. The mixing tools and container are quickly washed in a bucket of clean water. **NEVER...NEVER...NEVER..**dump plaster down a sink or other drain. Use a bucket or other suitable container that is filled with clean water to wash your tools etc. Allow the plaster residue to settle overnight in the bucket. Carefully pour off the water and throw the residue in the trash.
 - H. When pouring plaster into molds - After the plaster has reached a mushy state you can run a metal straight edge lightly across the surface to remove excess plaster. Do this several times to remove the crest of plaster. This step is called "SCREEDING".
 - I. Plaster builds up heat as crystallization takes place. Wait until the heat has dissipated before removing a casting from the mold.