

# CASTING INSTRUCTIONS

**BEFORE CASTING READ THESE INSTRUCTIONS COMPLETELY  
AND FOLLOW THEM CAREFULLY.**

Metal casting is not intended for use by children. It is an adult hobby and should be treated as such.

## **PRECAUTIONS:**

1. Work in a well ventilated area.
2. Never add water to hot metal or work in an area where water may splash into the hot metal.
3. Keep all liquids away from the casting process.
4. Make certain the molds are dry and free of any moisture before pouring.
5. Use of eye glasses or goggles and gloves is always recommended.
6. The mold and stove should be placed on a metal plate or non-flammable, heat resistant pad to catch any surplus metal that may flow out of the mold while pouring and prevent any possible heat damage to your work table.
7. Keep the stove cord from dangling down off the work table to prevent getting tangled in it, and pulling the hot stove and casting metal off the work table. Also, keep the ladle handle from hanging out over the work table.
8. Wash your hands after working with the metals and before handling any food.

## **CASTING METAL MOLDS:**

Follow Above **PRECAUTIONS!**

Check to see if the metal molds are clean and free of any greasy substance. Mold handles should be used on the metal molds. They are threaded onto the screw located on the back side of each mold. Always wear heavy duty gloves for protection when handling hot molds and pouring metal.

We suggest that you blacken the metal molds with our Mold Blacking Spray (MS13), or soot from a candle flame or alcohol lamp (do not use this technique with the silicone rubber molds). For additional lubrication, use Extra Fine Graphite Powder (MS22) for optimum lubrication after the metal mold has been blackened.

When using graphite powder, **work over a protected area as graphite is very dirty.** To apply graphite powder, dust the mold with the graphite lubricant and rub the powder into the mold with your finger to form a grease like coating. Tap off any excess powder. A metal mold must first be sprayed with Mold Blacking Spray before the graphite powder will stick.

This process will aid in obtaining a fully poured figure and in the release of the casting. An unblackened mold will not permit the metal to flow properly. Next pre-heat the mold by making one or two practice pours.

**TO CLAMP METAL MOLDS:** Insert the mold into the metal mold clamp we supply or clamp with a C-clamp. Some old molds made prior to 1945 are very thick and need to be clamped with a C-clamp and placed on a flat metal plate to form the bottom of the cast figure. Be sure to place a protective pad under your work area to protect against any metal spills, leaks or run off.

## **CASTING SILICONE RUBBER MOLDS**

Follow Above **PRECAUTIONS!**

For Silicone Rubber Molds, use Extra Fine Graphite Powder (MS22) for optimum lubrication or talcum powder as a second choice. This process will aid in obtaining a fully poured figure and in the release of the casting. An unblackened mold will not permit the metal to flow properly. Clap the molds together to remove any loose powder.

Position the masonite board mold supports on the outside of each mold half. The mold should be clamped in at least two positions with spring clamps for best results. Some molds may require clamps in all four corners. While others you may have to lighten up on the mold clamp force due to crushing the mold and keeping the metal from filling the mold. You can do this by eliminating the spring clamp and holding the mold securely with a rubber band or use a rubber band to counter the spring clamp by wrapping it around the clamp handles. Be careful when doing this as the mold may tend to leak, especially if it has been poured several times and has temporarily warped by the heat of the casting metal. Be certain to work over a protected area.

Pour the metal quickly into the mold, fill to the top. Rubber molds tend to swell when hot (even when clamped). We have found that squeezing the molds together with your hands after pouring and tamping the mold down gently at the same time helps improve the detail and reduce the flashing around the figure. Always wear gloves when pouring and holding the mold. Allow mold to set for at least 1 minute.

After several pours, rubber molds expand from excessive heat build-up and may leak. If you cannot stop leakage by clamping and squeezing the mold, allow mold to cool.

Properly handled, the rubber molds will give you long and continuous use. Since rubber is not as good a conductor of heat as metal the rubber molds retain the heat of the hot metal longer than a metal mold. Continuous rapid pouring can overheat and burn a rubber mold.

To facilitate the casting of complete figures in the new rubber molds some of the figure components may have been gated off to a side (arms, weapons, etc.). These figures will require some assembly such as gluing or drilling.

Release the figure bending the rubber mold slightly if necessary.

#### TO PREPARE METAL FOR CASTING:

If you are using the small casting stove we supply or the Hot Pot 2 place the metal ingot in the ladle and allow it to heat for at least 15 minutes after the metal has melted. It will take about 15 minutes for the metal to melt but you must not pour it yet. The metal will not overheat in these two stoves regardless of how long you keep heating it.

You could use your own gas or electric kitchen stove, however, you must be careful not to allow the metal to be heated over 650 degrees F or you will damage the metal molds. The metal molds are made of a zinc alloy "Zymac" which will start melting at 680 degrees F.

**Please note that our small electric stove may smoke quite heavily for about the first 15 minutes of use. Do not be alarmed as it is the industrial oils on the metal parts vaporizing.**

Another important thing to remember is that . If you have poured the metal to soon and not allowed it to heat up to its best pouring temperature you will not obtain a fully poured figure.

It is not recommended to use a torch or other flame source to raise the metal to a higher temperature as this could damage your molds. If you choose to use a different stove or heat source to melt your metal, item #90011, Casting Metal Thermometer, is an excellent tool to have on hand.

To Check the temperature without a thermometer, you can dip a used wooden match stick into the molten metal for about 5 seconds to test the temperature. If the stick smokes excessively it indicates that the metal has been overheated which can cause damage to the mold and a bad casting. Allow the metal to cool so that the match stick smokes only slightly.

Do not use pure lead, pot metal, or tire weights as a casting metal without adding 10% tin by weight as these metals have too high a melting temperature to flow acceptably at 650 degrees F. If you attempt to use these metals by using a different heat source you will damage the molds.

Pure tin is the best material for pouring figures. It has better flow characteristics and figures made from pure tin can be bent into different positions without breaking. However, due to the record high price for tin this metal is not practical to use. Whenever pure tin or a high tin alloy can be used it is recommended. Overheating the metal produces a frosted figure. Although this type of figure loses some detail it does provide a better surface for the paint to adhere to.

If the small black stove (MS1) made by Castings fails to work at any time after the one year warranty you may return it to us with \$6.00 to cover the cost of repair, return postage & handling. During the first year you may return it for repair free of charge.

### TO CLEAN AND DECORATE FIGURES:

Break off, snip and scrape all excess metal from the figures. File smooth the parting lines. Each figure should be wiped clean with vinegar or naval jelly to remove any oil or grease from your fingers prior to priming and painting. This cleaning affords a much better surface on which the paint will hold. When the figure is clean brush on or spray a coat of metal primer. Our gray, white or black primers work best with the metal figures prior to painting. Decorate the figure with paints developed for metal miniatures. If you are casting with pewter check our pewter instruction sheet.

We offer a 55 page booklet "Helpful Hints For Casting And Painting Miniature Figures" (MS48) which covers many topics of interest to the miniature hobbyist. See our supply list for the booklet information.

### Suggestions for best filing results and care of files:

Files should be moved across the surface of the metal in **one direction only**. When the stroke is completed the file should be lifted and returned for another pass across the metal. Pulling the file backwards across the metal dulls the cutting surface quickly

Files should never be laid one on top of another, allowed to touch or be touched with the fingers. Moisture, dust and skin oils collect dirt reducing their effectiveness and life.

Files rubbed with blackboard chalk will not clog easily with metal particles. When the cutting surfaces of a file are clogged with metal they can be cleaned by pushing a short section of copper wire across the file in the same direction as the cuts. This pushes the metal out of the serrations.

After casting **you might** want to leave the sprue in place and not cut it off the figure at this time. It will be a good place to hold while working and polishing. If you use the alligator clips of a Helping Hands Tool it also is a good holding place. If this is practical cut the sprue off when work on the casting is completed.

Surface pits in the metal or sink depressions can be filled with new material soldered in place, then ground out smooth (refer to soldering instructions).

At this time any detailing should be done. Adding detail with the use of a Dremel Power Tool and flexible shaft with various burs, cutting or sanding attachments can produce professional, quality results. Using a Dremel, you can add or alter the detail of casting, make conversions of body parts and weapons, add muscular features to horses, change facial detail or even make folds in clothing. If you intend to use power equipment for detailing please refer to the directions given with your power tool for its use.

### To reposition arms, legs, and heads, try the following:

Using a razor saw, jewelers saw or Dremel tool with a saw attachment cut part way through. Do not completely cut off the part.

To bend an arm, saw out a notch 95 deg., angle on inside of the elbow bend the arm inward. To straighten an arm cut a slit in the inside of elbow and then bend it outward.

For turning a head, cut through outside all around, leaving about 1/8" core, then gently twist the part.

Brush all the holes or seams with flux and then fill with solder or FastSteel.

## HAVING DIFFICULTY IN OBTAINING FULLY POURED FIGURES?

### THE FOLLOWING SHOULD HELP.

Metal casting does not always produce perfect figures. Even commercially made die cast or spin cast figures do not always come out just right, but you never see them as they are put back in the pot and cast over.

The most important factors in obtaining fully poured figures are:

1. **Use a high tin content casting metal**, 10% tin should be minimum, (CM2). While 65% tin is optimum, (CM4) having the lowest melting point of the tin/lead alloys. If the metal you may have is primarily lead or an unknown lead alloy, then at least 10% tin by weight should be added. Pure lead has too high a melting temperature (620 degrees F) to be used successfully with our molds. 100% tin (CM5) can be obtained directly from our company.

The best pouring metals for difficult to fill molds are our CM3 or CM4 (50% tin) and our PS1 (91% tin, lead free) Pewter ingots.

2. **Raise the temperature of the casting metal** to the maximum allowable temperature without damaging the molds (570-650 degrees F). Use our casting thermometer (#90011) to eliminate the guess work. TO reach the proper pouring temperature you must allow the metal to heat at least 15 Minutes after melting before pouring the mold. If you do not have a casting thermometer and are still experiencing problems, some hard to fill molds need the metal to heat up to 1 hour before pouring. Doing this will almost guarantee a perfectly cast figure.

3. **Dust the rubber or metal molds with the graphite lubricant** (MS22) Rub the powder into the mold with your finger to form a grease like coating. Tap off any excess powder. To apply graphite powder to a metal mold requires it first be sprayed with Mold Blacking Spray (MS13).

4. **As a last resort, carefully cut a vent.** If you are still having difficulty there might be an air blockage preventing metal from flowing to a particular channel. A shallow V-shaped vent can be cut, slanted away and up from the farthest point in the channel where metal is not filling, to the outside of the mold. This will allow the metal to push the air out the vent when pouring and fill the cavity. During the pour you will see some metal come out this vent and know the cavity is now full. The small piece of metal filling this channel is easily trimmed when the figure is released. It is very important when cutting a rubber mold that only a very sharp pen knife be used.

If the metal just dribbles through the pouring gate you might need to enlarge the pouring gate hole with a file or Dremel tool on metal molds or a pen knife on silicone molds.

5. With rubber molds you might also try **lightening up on the mold clamp force**. You can do this by eliminating the spring clamp and holding the mold securely with a rubber band or use a rubber band to counter the spring clamp by wrapping it around the clamp handles. Be careful when doing this as the mold may tend to leak, especially if it has been poured several times and has temporarily warped by the heat of the casting metal. Be certain to work over a protected area.