

# *Casting Secrets*

## **Safety Comes First**

1. No casting should be done without basic safety equipment. This includes long pants, shirt sleeves, sturdy gloves, eye protection (such as goggles), and closed top shoes.
2. Keep all flammable items away from casting area. Do not operate unit on flammable materials such as paper, wood, or carpeting. Keep primers, loaded ammunition, Powder, and other shooting accessories away from casting area.
3. Casting should be done in a well-ventilated area. Avoid breathing fumes and dust from furnace.
4. Never allow moisture near molten lead. When moisture is introduced to molten lead, a terrific steam explosion occurs and molten metal sprays not only over the immediate area but also over the bullet caster. This moisture can be introduced by a wet ladle or dipper. ALSO: Never put a COLD dipper into a lead pot as it will act in the same manner as water. Warm it first.
5. Keep children away from casting and reloading areas.
6. Never pick up unit when heated.
7. Never drop poorly formed bullets or sprue cut-offs back into the molten lead in the pot. This can cause molten lead splashes which can seriously burn the user or damage property. Always use caution when adding bullet metal to a furnace or pot containing molten metal.
8. Do not continue to cast if distracted.
9. Do not eat, drink, or smoke while handling lead.
10. Do not run unit dry without lead, except during initial warm-up period.
11. Keep the plug dry.
12. Always wash hands after handling lead. WASH YOUR HANDS WELL WHEN DONE. Lead is soft and will rub off on your fingers.
13. Be certain to place and use the melting pot where it cannot be tipped or knocked over. Never leave a unit unattended.
14. When finding lead to use in casting, never use lead from any kind of battery.
15. Keep bench area clean from sprue and droppings. Always clean casting area afterwards. Periodically damp-mop.

## **Taking Care of your Victory Mold**

Your Victory Mold is precision equipment which, with care and common sense, can easily last a lifetime. But it can be ruined in one session, if abused. Before using a new mold,

it must be cleaned with a suitable solvent, such as alcohol or an aerosol degreaser, to remove the protective film of oil. Never cast bullets with oil still in the mold as the oil will vaporize and leave an undesirable baked-on residue.

Check alignment pins in mold for wear when the blocks are closed together. Try to twist the halves in opposite directions. There should not be any movement. If there is movement, drive the pins in very slightly until all movement is gone. Check that the blocks still close fully.

Our molds have a clearance ground between the two halves for venting purposes, so a strong light will show through the halves. However, this light should not show through at the corners. This is VITALLY important in obtaining round bullets!

After casting, clean your mold. Wipe off any splashes or smears of lead with a rough rag. If the lead spatters are difficult to remove, re-heat the mold blocks until the lead wipes off easily. Never use an abrasive material or scraping tool to remove lead from the mold. When your mold is clean, allow it to cool, then re-oil it with rust- preventative oil. This oil must be removed each time before casting.

Alternatively, store your cool, clean mold in an airtight container with a bag of desiccant crystals or a piece of VCI paper. Molds preserved in this fashion do not require cleaning before their next use. Whichever preservative system you choose, store the mold in a dry place of relatively constant temperature. Note: Leaving the last bullet in the mold cavities offers little, if any protection.

From time to time, check the sprue cutter plate. This plate should swing freely, without vertical play. If too loose, the sprue will extend beyond the base of the bullet. A bit of graphite or Motor Mica, sprinkled between plate and block, will greatly reduce friction.

## **Lead Alloys and Gas Checks**

Pure lead is suitable only for muzzle loading conical and roundball projectiles or shotgun slugs, not for centerfire rifle and pistol bullets. To harden pure lead into a better bullet material, tin must be added.

Tin and lead mix well when melted, and a good bullet alloy should always contain tin to enhance castability. The presence of antimony in the alloy, especially for gas check bullets in rifles, has an advantage. It hardens the alloy, making the bullet less liable to gas-cutting and more capable of withstanding higher velocities. Because antimony shrinks less when it cools, bullets of antimony alloy will cast a little larger than softer alloys. Antimony should be kept to 5% or less of the total alloy as more than this causes casting problems.

The gas check is a shallow gilded metal cup which must be pressed onto the base of a cast bullet. The purpose of this cup is to protect the bullet base from the burning effect of hot powder gases. It also acts as a scraper to push the lead out the bore. Gas check bullets, since they can be driven at higher velocities than plain base bullets, will give flatter trajectories and greater energy. Even with a gas check, however, the lead alloy bullet

cannot be driven as fast as some jacketed bullets or it may lose accuracy and lead the bore.

## **Bullet Casting**

### A. Necessary Equipment:

Bullet Mold

Mold Handles

Bullet Metal -- Made from appropriate lead alloy.

Lead Pot or Electric Furnace, bottom pour pots are not recommended.

Fluxing Material -- Tallow, beeswax, Marvelux or any other bullet lubricant may be used.

Lead Dipper -- For pouring and stirring metal.

Small Wooden or Metal Box -- To receive sprue, scrap, or rejected bullets from your mold.

Cloth Pad -- Any old cloth made with natural fiber material which may be used as a pad to soften the fall of the hot bullets as they drop from the mold. Must not be synthetic since hot bullets may melt it.

Protective Clothing -- Includes glasses, gloves and apron for protection against spatters. Shirts should be long-sleeved, trousers full-length, and shoes close-topped. No slippers or sandals.

### B. Preparing Metal (Melting & Fluxing):

If using a lead pot, place it securely on a gas or electric stove and put a quantity of bullet metal into the pot. Add metal as needed to raise the level in the pot close to full. Set the lead dipper in the pot to preheat it.

In about 20 to 30 minutes, when it becomes liquefied and flows freely, the bullet metal will be ready to flux. For fluxing, allow adequate ventilation.

To flux the metal, merely drop in a small bit of tallow, beeswax, bullet lubricant or Marvelux. A smoky gas will rise from the top of the pot. To eliminate this gas, light it with a match (Marvelux does not need to be ignited). Stir the mixture with the dipper. Metal which has been properly fluxed will have a mirror-bright surface flecked with a small quantity of black or brown impurities. Skim off these small flecks of foreign matter. Flux the metal whenever it seems to need it.

Use a good calibrated thermometer, and record casting temperatures for your various alloys and molds, they could vary from 650 -825 degrees.

### C. Casting Bullets:

Note: Always wear safety glasses or goggles while casting bullets.

When the metal has been fluxed and is hot enough to pour easily through the dipper, it is ready for casting. Fill the dipper with metal and place the spout with the mold turned on

its side. Holding the mold and dipper together, slowly turn them into a vertical position, with the dipper on top of the mold. Be generous with the metal and let extra run onto the mold's sprue cutter plate. Pour the entire content of the ladle over the sprue so fresh metal can enter the mold during cooling. This extra metal is called sprue. When it hardens, which takes only seconds, pick up the casting mallet and tap sprue cutter plate sharply, or use a heavy glove and pop it with the heel of your hand. This will separate the sprue from the base of the bullet. Drop the sprue from the base of the bullet into a scrap box. With the mold held close to your cloth pad, open the blocks and let the bullet fall to the pad. If the bullet does not drop readily, use the mallet to rap the handle hinge pivot sharply. Use only wood (or similar non-marring material) for this purpose. Never strike the mold blocks themselves.

Your first bullets will be somewhat flawed because the mold is cool. Casting bullets, one after the other will bring your mold to the correct temperature. Wrinkled bullets indicate that the mold, or metal, is too cool. Frosted bullets indicate that the mold, or metal, is too hot. Good bullets should be clean, sharp, and fill the mold. This is usually 20-30 bullets, new molds could take 70-100 before they settle down to cast well. Have patience! They need not be bright because their color will depend largely on the mixture of the alloy being used. Antimony alloys are duller in color than those of pure lead. Imperfect bullets should be collected and, along with sprue and other scrap, returned to the pot. Never dip your cool mold into molten bullet metal because the rapid temperature change may cause permanent block warpage. Also, never cool your mold in water as this will ruin them too!

## **Lubricating and Sizing**

### A. Necessary Equipment:

Bullets -- You have cast these already.

Gas Checks -- If your bullet design requires them.

Bullet Lubricant -- Alox/beeswax. SPG or any number of quality products.

Lubricator and Sizer -- With correct top punch and sizing die for sizing your style and caliber bullet.

Gas Check Seater

Lube/Sizer Heater -- It heats the Lube/Sizer to the right temperature, allowing smooth, effortless bullet lubrication (optional).

Before your newly-cast bullets can be loaded into cartridges, one further operation is necessary: Cast bullets are designed with lubricating grooves around their circumference. These grooves must be filled with a suitable lubricant to prevent barrel leading and maximize accuracy.

Since each Victory Mold is custom made to your specifications, little or no sizing will be necessary. In the event you still require sizing, please use the following directions:

## B. Choosing a Bullet Sizing Die:

The correct-sized diameter for your cast bullet depends upon the groove diameter of your gun. The exact-sized diameter is a determination that only you can make. Experienced shooters usually prefer bullets sized to or as much as .002" above exact groove diameter, with the exception of black powder muzzle loading rifles, which usually shoot best with bore diameter bullets.

Carefully drive a SOFT lead slug through the lightly lubricated bore. The slug should be large enough so that some excess lead is shaved off as it enters the muzzle. Insert a cleaning rod into the breech and carefully tap the slug back out of the barrel. With a micrometer, measure the diameter of this slug at its WIDEST POINT. This is the groove diameter of your firearm. Usually a sizing die up to a couple of thousandths of an inch larger than the slug will be best.

Place the gas check, if one is required, in the center of the sizing die. The bullet is placed, base down, on top of the gas check. If a gas check is not being used, place the bullet, base down, in the center of the sizing die. Align the point of the bullet so that it centers itself in the top punch and pull the handle down firmly. Hold the handle down firmly while turning the ratchet handle slightly to force lubricant into the bullet grooves.

When you raise the handle, the bullet will be ejected, completely sized, lubricated, and ready for loading. However, if the gas check will not fully seat on the bullet using only finger pressure, a gas check seater should be employed for best results. Next, a gas check is set, cup-side up, in the center of the sizing die and a bullet guided into it as you pull down on the operating handle. Use only enough force to fully seat the gas check. After all the gas checks have been installed, remove the seater and size and lubricate normally. Use of a gas check seater ensures the squarest possible bullet base regardless of the type of gas checks used. A good square bullet base translates into improved accuracy. Loose gas checks are disastrous to accuracy. Make sure that after the bullet is ejected from the die, the gas check will not rotate on the bullet or pull off.

## **Loading Cast Bullets**

Keep in mind that cast bullets are more fragile than jacketed bullets. And will not tolerate a heavy hand. Use an expander of groove diameter (VERY IMPORTANT) and chamfer the case mouths watching for shaved lead (VERY BAD). This is where many hand loaders get into trouble. The bullet should be held firmly, but in many cases you can actually rotate the bullet in the case of the loaded round or even seat the bullet with your thumb. Too much neck tension can deform cast bullets and destroy all you were working for. All bullets, of course, should be seated the same depth in the cases, usually just touching the lands in the throat of the rifling.