



## Equipment List for Beginner Bullet Casters.

The following equipment list is not exhaustive; it is purely a guide to help you get started in casting your own bullets with the minimum of financial outlay, but still producing good, accurate bullets safely.

### 1. Safety Equipment

I believe this section to be the most important, and that's why it's the first section you will read.

Remember that you are dealing with molten lead when casting bullets; the temperature is in the 650-800F (350-450C) range. Molten lead has the capacity to stick to skin and burn deep. It is highly recommended that you purchase leather gloves, a leather apron and a full face mask; most safety shops will stock these items. It is also recommended to always cast in a long sleeved shirt and long pants, jeans etc., with sturdy boots of some description. Set up your casting gear in a well ventilated area, out of the way of any possible moisture problems. Take extra care to set up your equipment from any chance of a drop of water or moisture hitting the molten lead. The water instantly turns to steam and often causes an explosion. While casting one night I had a moth decide it wanted to take a swim in my lead pot, the split second it hit the pot, molten lead went everywhere, I ended up with a few pieces on my apron and one on my face mask, this would have hit me in the face had I not had a face mask on. I now have a piece of Aluminium foil that sits on the top of the pot if I have to cast at night under lights now. You only get one set of eyes, look after them. Please also remember to keep children and any pets away from the area. Accidents happen way too quickly.

### 2. Bullet Mould and Handles

It's probably come as no surprise that you will need a bullet mould, single, double, triple, four or six cavity, brass, cast iron or aluminium, the choice is yours, multiple cavity moulds can sometimes be troublesome and can get heavy to use after a lengthy casting session. Single cavity moulds offer the best choice if you don't need lots of bullets, or if you are after the best possible consistency between bullets. A good set of handles is an investment, buy a good quality set and they will last you for years, and are interchangeable between most brands of moulds, so one set is enough, although after a while you will most likely buy more sets, as it is often advantageous to cast using two or three moulds, rotating between them, this way no mould will get too hot to cast with properly. You will need something to cut the sprue plate open with, CBE sells a very tough Mahogany mallet, but even a piece of one inch dowel would do. Cut the sprue open in the same plane as it pivots, to lessen the chance of bending the sprue plate. I cut my sprues into an old aluminium dish, returning the sprues to the melting pot every 10-15 casts or so. When opening the mould, most times a bullet will stick in one side of the mould or the other, a gentle tap with your mallet on the hinge pin of the handles will often make them drop. DO NOT ever hit a mould directly with anything, you run the very real risk of damaging the mould. An old towel folded in two or four is always useful to drop the bullets onto from the mould. The bullets are still relatively soft at that point; take care not to drop them on other bullets, as damage could result. Let them cool fully before handling them. An old dessert spoon is handy to have nearby to spoon sprue back into the melting pot, to stir the alloy from time to time, and for moving bullets around while still too hot to touch. All CBE moulds are sold with all the allen keys needed to make adjustments on the mould, have them nearby makes life a little easier.

### 3. **Equipment to melt your bullet alloy**

Something as simple as a single ring gas burner purchased from a camping shop will easily provide enough heat to melt lead and allow you to cast bullets. You'll need a hose, regulator and a gas bottle to complete this part. A cast iron or aluminium flat based vessel will be good enough to melt alloy in. You'll want it flat on the bottom for stability and deep enough for the lead dipper to be able to scoop a full dipper out. It should be big enough to hold at least 10 kgs of bullet alloy. This will allow you a decent casting session without temperature fluctuations or the pot getting cold and not filling out the mould properly. You will then need something to get the lead from the pot to your mould, and a commercial casting ladle is needed here, they hold a good amount of lead and have a pouring spout on them to match up with the sprue plate hole on most moulds. A temperature thermometer designed to read in the range we need is also pretty handy, not completely necessary, but certainly a big help to know what temperature you are casting at.

If you get really serious into casting or want to cast lots of bullets quickly, then one of the range of bottom pour pots might suit you a little better. Be aware though that quality costs money, the LEE aluminium ones, whilst quite good and easy to use, do not seem to have a long life, I've been through three of them in 30 plus years of casting. They do the job, but have a tendency to develop leaks around where the spout joins the pot. The heating coils and thermostat burn out pretty regularly as well. I now use an RCBS pro-melt pot and have done for the last 10 years or more, never had so much as an issue with it ever, but they are expensive, I think mine was around \$600-00 when purchased. Many shooters will tell you that a bullet cast from a bottom pour pot will never be as good as a ladle cast bullet. I'm sure we could debate the pros and cons here for months, and still end up disagreeing. Totally up to the user and your budget.

### 4. **Lead Alloys suitable for casting bullets.**

I'd say the most widely used lead alloy for casting bullets would be wheelweights, generally obtained from most tyre shops across the country. Wheelweights will make a very suitable alloy for all pistol bullets and most rifle bullets for all but the highest velocities. The addition of around 2% tin will certainly increase the castability and will provide you with nice, shiny well filled out bullets. Pure lead comes in many forms, such as lead sheeting from homes and lead head nails also found on old homes. Pure lead is suitable for muzzleloader bullets, but if you mix it at a rate of 30 parts of lead to 1 part of pure tin, you will have a fine alloy for any and all Blackpowder projectiles. Some shooters prefer 20:1 or 40:1, it's worth experimenting to see what works for you the best. Straight Linotype is the hardest alloy generally available to casters, it is a very hard alloy and works in high velocity rifle loads, but can also be too hard in some instances, causing skidding at the start of the rifling, instead of a softer alloy that will bite into the rifling. Linotype is also quite brittle. It is of little use as a hunting alloy, bullets tend to perform as an FMJ would.

Range scrap in my opinion is not worth the effort to pick up, unless the resultant batch of cleaned up and the mixed alloy can be assayed, you have no idea what hardness it is, and every time you make a batch, it is sure to be different. My recommendation would be to contact a local smelter and ask them for their "house blend", which should be something similar to Lyman #2 alloy or Hardball. This alloy will serve nearly every purpose you can think of for smokeless loads, and you can be sure of consistency every time you buy a batch of metal.

A point to remember is the harder an alloy it is, the lighter the bullet weight will be, and the larger the diameter will be. Take for example, a .458" diameter projectile, weighing 400 grains from Linotype, if cast from Wheelweights, it will be around 20 grains heavier and nearly 1 thou smaller in diameter, from a 10:1 alloy, it will be 17 grains heavier and also 1 thou smaller in diameter, and if cast from pure lead, it will be 36 grains heavier and 2.2 thou smaller in diameter.

**That's about all you need to cast your bullets, now we have to lube them and possibly size them.**

## 5. Lubing and Sizing Equipment

The most basic way to lubricate a cast bullet (and Yes, they have to be lubricated) is to use one of the commercial tumble lubes. CBE sells two different ones, the standard XLOX type which is the same formulation as LEE liquid Alox, and a new one called 45-45-10, it is XLOX with 10% Japan Wax added. It is a little thinner in consistency than XLOX, but dries to a harder finish and tends to allow a little more velocity before leading than XLOX. Just remember that any tumble lubes are good to about 1500 fps at best, they will generally perform better at lower speeds, tumble lubes are perfect for handgun use or light rifle loads.

All you need to do is to put some bullets in an ice-cream container, squirt in some lube, rattle them around until they are well coated in lube and put them out on some grease-proof paper until dry.

The next method is called Pan lubing, and has been around for as long as bullets have been cast.

All you need to do is to stand up your bullets in a shallow dish, just make sure it's deep enough so the lube will cover all the lube grooves. Melt your choice of bullet lube in a double boiler, never by direct heat, and pour into the tray around your bullets. Let it harden up for a day or two and then you can either make a "cookie cutter" or just cut the base off an old case of the correct calibre and use it to cut the bullets out of the lube. You can keep re-melting and using your lube over and over again.

Both of the above methods are great for plain base bullets, which incidentally are good to around 1500 fps as well. If you want more speed, you'll need a gas check mould. If you have bought a gas check mould, then we need to crimp on the gas check in some way, and there are two ways we can do that. Firstly, the least costly method is to buy a LEE sizing kit in the correct diameter for your requirements. Unfortunately LEE only make some of the more common diameters, they will custom make them for you, at a price. The LEE sizing kit simply screws into your standard 7/8 x 14 tpi reloading press and the pusher rod clips into the shellholder slot. The gas checks are placed on the bullet base and pushed through the die, it has a tapered lead to begin with and the parallel sizing section after that. Bullets are pushed nose first into the die, sized, gas checks are crimped on and they exit the top of the die. You would then lube as per tumble lube or pan lube methods.

If you intend to cast for multiple calibres, or shoot lots of cast bullets, then one of the commercial lubri-sizers might be best for you. They are made by RCBS, Lyman and Saeco. They are a self-contained unit that lubes, sizes and applies gas checks in one pass of the handle. Both the RCBS and Lyman machines use the same H&I sizing die and top punches, which are easily interchangeable between calibres. The Saeco machine has its own sizing dies and top punches, and are generally harder to find than the H&I ones. The Saeco machine is considered the Rolls-Royce of sizers though. RCBS is very good, with Lyman the second place. Lyman machines have a tendency to break the handle, although I'm not sure why you would ever need to apply that much pressure to size a cast bullet. H&I sizing dies can be had in diameters from .224" up to .540", in one thou increments. You only need one of them per calibre you are loading, unless you want to experiment with different diameters. As a pretty generalised rule, size to one thou over your barrels groove diameter. Top punches are made to match the shape of the bullet nose and are mounted in the ram of the lube-sizer and used to push the bullet base first into the sizing die. One is required for every bullet design you have, except for case where the bullets noses are the same profile.

If you are a smokeless cast bullet shooter, I very highly recommend LBT Blue Soft as the preferred bullet lube, it flows easily through a lube-sizer and doesn't need heating to make it flow. I've had many reports from users of it that report better accuracy and less leading by using LBT Blue Soft. Some of the harder bullets lubes in my opinion offer nothing over LBT, except that you need a lube-sizer heater to heat the lube enough to make it flow through the machine.

Blackpowder shooters require a more specialised lube, something like SPG; it was developed just for Blackpowder, although it also works well in lighter smokeless loads. Blackpowder lube is usually a thinner consistency, and has to provide lubrication properties and also soften Blackpowder fouling, making repeated shooting without cleaning possible.

6. **A few more points to consider**

I might also like to mention here about cast bullet speed. If you think that you can just swap a jacketed bullet for a cast bullet and use the same load, then you might need to read up a bit more in some of the dedicated Cast Bullet manuals. Lyman publish a really good one, as does LBT and RCBS.

In some calibres, speeds the same as jacketed bullets are quite possible, these are calibres where any load is around the 2200- 2400 fps range. Even a gas checked bullet, with the best lube, shot in the best barrel is limited to about the 2400 fps level, WITH SOME FORM OF ACCURACY. From my years of experimenting, velocities in the range of 1500-1800 fps will always give the best accuracy, without leading. Barrel twist is another issue that needs to be looked at, some of the ex-military rifles, particularly in 6.5mm calibre had very fast twist barrels, in the 1 in 8" range. Trying to push a lead projectile at near factory velocities from a 1 in 8" barrel is a recipe for disaster. The rotational forces at that speed are too great for most bullet alloys to stand up to, stripping out in the bore, causing very severe leading. A 6.5mm bullet at 2400 fps in a 1 in 8" barrel is doing approximately 216 000 rpm!

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