

A Basic guide to
Pewter
Casting.

By Sveinn inn kyrri Grimsson

Safety First.

Working with liquid metal can be extremely dangerous, and some precautions need to be taken before we start. Hot metal stays hot and can stick to skin causing deep penetrating burns. To protect ourselves during casting and to help prevent medical issues, we need to use personal protective equipment.

P.P.E. (Personal Protective Equipment)

- Gloves,
- Face mask,
- Goggles/glasses,
- Long sleeves,
- A safe working area.

Molten metal can spatter, run, pool, and disappear into cracks. Whilst pewter's melting temp isn't exceptionally hot, it is still hot enough to ignite some materials. More than likely this won't happen, however it is a possibility to watch for. Your work area should be clean, and heat resistant. Preferably it should be able to contain any molten metal spills.

When working with molten metal you need to make sure that everything is dry, especially your mould. Water in your mould has the potential of exploding into steam when the molten metal touches it, that can then break moulds, and even send hot molten metal flying through the air.

Pre-heating your moulds is a safety procedure which is designed to prevent this, as well as thermal shock from your mould material trying to heat up too quickly. Pre-heating your mould also allows the pewter to flow easier which can give you finer detail. To pre-heat your mould, either use an oven at around 200 Deg C, or place the mould over your burner for a minute or two before casting.

With highly detailed moulds, it might be necessary to heat your mould if you leave it sit for more than 30 seconds between castings. The process of setting causes the molten pewter to heat the mould each time you pour, but if left too long, your mould will cool, and need reheating.

Equipment.

The equipment needed to cast pewter is fairly rudimentary, and whilst I use modern equivalents there is nothing stopping someone using a few basic tools and an open fire.

- A heat source, capable of reaching about 350 Degrees Celsius.
- A ladle or melting crucible capable of being poured.
- A mould capable of safely reaching about 350 Degrees Celsius
- Tools for carving
- A saw for preparing your mould

Apart from the safety equipment above, you will need a heat source. My preferred heat source for Pewter casting is a Gas Cook top, however not having one at home the next best option (and sometimes a better option) is a Portable Camping Cooker. The Gas cartridges cost about 2 dollars, can last a few casting sessions, and are easily available at camping stores and discount stores. This set provides enough heat to melt multiple ladles or a large pot.

A ladle can be either made or purchased. Master Blayney has made a few ladles from fence post tops and a small bit of metal bar or rod. These ladles are nice and solid, and provide enough molten metal for a decent sized pour. Another option is a small kitchen ladle that is all metal, preferably stainless steel. If you are casting a large number of objects, you might like to use a melting pot and ladle molten metal into your moulds. If you are casting a small number, or just a one off, then melting the pewter in your ladle is sufficient.

Carving tools can be purchased from an art supply or jewelers' supply store, or can be made or improvised. A carving tool is simply a handle with a metal carving implement glued into the end. A small screwdriver is sufficient, as is a piece of dowel with a sewing needle embedded in it.

A great way to get a variety of shaped and sized carving tool ends is to shape a hard metal wire and then glue it into holes drilled in the ends of the dowel. This method also allows you to make the correct tool for the job every time.

Moulds.

Casting pewter requires a negative or mould in which to pour the molten metal. This mould can either be simple, or highly detailed. There are a number of ways to make a mould for pewter casting; these options all depend on what finishing you will be applying and what your ultimate goal is. Sometimes a texture or grain from the mould material is desirable, or sometimes the object is going to be highly finished, and a high quality mould is not required. The two types of mould that we are discussing today are Cuttlefish and Soapstone. There are other types of mould material available, as well as many other ways to make a mould. There are also a number of ways in which to create the mould, here we will discuss pressing, and carving.

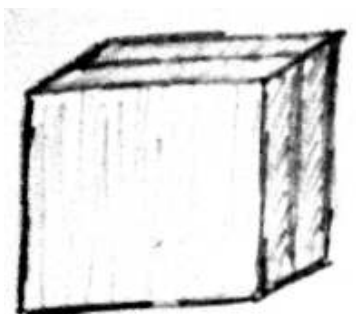
Cuttlefish

- Cuttlefish bone can be found whilst taking a walk along a beach, or purchased from either a pet shop or a jewelers supplier.
- It is very easy to carve into with small tools or pins.
- Cuttlefish has a limited life when casting, as the material slowly burns away after multiple pours.
- Cuttlefish allows carving or even pressing, however the detail is poor, and the casting usually shows the grain of the cuttlefish bone.

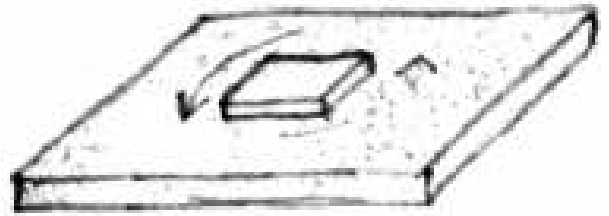
Soapstone

- Soapstone is a soft stone with a fairly uniform hardness which is fantastic for carving.
- Its thermal qualities are perfect for pewter casting.
- It is very robust as long as it is well treated, and can be used for many copies of the same object without much mould deterioration.
- Soapstone can only be used for carving.
- There are many examples of soapstone being used in period to make moulds, some moulds are still capable of making decent pours.
- You should use glasses and a mask when carving Soapstone.

Preparing a mould starts with cutting the basic block. This should be about one to one and a half inches thick, and around four to five inches on each side. Once cut to size, carefully split the block into two slabs. Saw fast but steadily, not trying to force it. Let the weight of the saw do the



cutting. When you have two thin slabs, you need to finish the surface. I use a concrete block to do this, putting the slabs on the cut face down, and moving them in a circular motion until they are completely flat. Do this



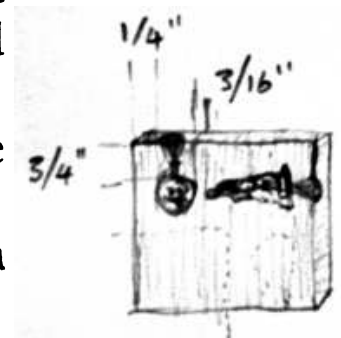
with both slabs. When they fit together, there should be very little gap, if you hold it up to the light you shouldn't be able to see much light coming through. You have finished your mould preparation, now you need to carve the mould.



Carving Moulds

When carving your mould there are only a few things that you need to know, everything else is up to your own imagination.

- Everything should be mirrored - The left hand side of the mould will be the right hand side of the object.
- Take things slow and easy - You can always take more off, but once you have taken off too much, you can't replace it.
- Have a plan to start with - If you have a design worked out, then it's easier to make that happen, than it is to design as you go.
- Don't do undercuts - The finished cast needs to lift straight out of the mould, if you carve an overhanging bit, you will need to break the mould to get the finished cast out, making it good for only one casting.
- Leave a gap of about a quarter of an inch from the edge of the mould.
- Leave a gap of about three quarters of an inch from the top of the mould.



You will also need to create a channel to the mould carving in the shape of a funnel, providing an area into which to pour the molten metal. When cast, this will be cut from the casting, and can be kept to re-melt for future castings.

Make sure you are aware of how the molten pewter will flow through the mould cavity. Avoid multiple paths, as these can cause areas where air flow out of the mould is restricted as the pewter flows in.



Pouring.

Pouring a mould can be frustrating at times, and at others a very beautiful thing. Preparation depends on the mould you are using.

Cuttlefish requires very little preparation. Soapstone requires you to have preheated the mould and ensured that all water has been driven out. Preheating a Soapstone mould is also useful as it helps the metal to run through the mould before setting. A cold mould will take the heat out of the metal before it has had a chance to get through the whole mould.

Make sure you have thick gloves and all other Personal Protective Equipment on. Melt the pewter in the ladle or in a pot. The pewter is ready to pour when it starts to look like it has tarnished on top or turned a dull grey. Give the ladle a gentle swirl to clean the top of the pour space. Pour steadily but quickly, making sure you have control over the pour, and can stop before the metal overflows the mould. A smooth even pour without quick movements will ensure a clean casting inside.

Once poured, wait until the button (the bit of metal at the top), hardens before releasing the two parts of the mould. Do Not touch the casting with bare hands until it has had sufficient time to cool down. With soapstone, if the casting doesn't pour first try, attempt a few more in quick succession, some times more heat is required in the mould before it will pour correctly. If it doesn't pour even though there is more heat in the mould, you will need to adjust your mould and the channel into it. Start by widening the opening into the actual mould. If this isn't sufficient, then you might like to consider making the mould slightly deeper.

Finishing.

Once the casting has cooled, it is time to finish it. Finishing is the process of cleaning it up and removing any excess metal. This can be as simple as clipping off the sprue and quickly filing away the sharp edges. Or you could spend a lot more time filing, sanding, grinding and polishing. The amount of time you spend finishing an item depends on the look of the finished object you require. Some objects have a poorly or quickly carved mould, as the intent is to get a basic shape on which to spend a lot of time finishing.

Advanced Pewter-work

Pewter comes out of the mould a nice shiny silver, and can either be left that way to age over time, or by using chemicals you can blacken or age it. The process of aging pewter requires an acid to oxidize the outer layer of pewter, which is then allowed to dry, and brushed back. This process can be fairly messy, and should be done wearing rubber gloves. I shall teach this process in an advanced class later.

Another part of pewter-smithing is soldering parts together to form more complex shapes and even hollow items. This is an art that requires a steady hand and a watchful eye, as pewter very quickly turns from a solid metal, to liquid, and the solder used usually has a similar melting temperature to the pewter.



Thanks

I would like to take this opportunity to thank Katje for teaching me all she knows and Tyghra for all her encouragement. These two people have inspired me to pursue this hobby and turn it into something more than just an interest.

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This guide was written as a supplement to Sveinn's first SCA teaching class, and contains the information that he has gathered over the last year as well as knowledge and skills developed outside of the SCA. Designed to give those attending the class something to remind them of what they were taught so that when they next attempt to recreate the process they have something to fall back on.

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