

## Silversmithing Level 2B

### Pouring Ingots and Forging

Pouring ingots is an excellent way to use your scrap silver, or a good way to form pieces with more weight than you would usually be able to fabricate from purchased stock.

Things you will need:

- Ingot Mold
- Borax Flux
- Melting Dish and Handle
- Rolling Mill

#### Pouring the Ingot

1. Gather your silver... 20 grams is the most you will want to use with the largest wire ingot form. Scrap silver is fine, but be sure it IS in fact sterling silver and it is free of stones, beads or other objects that are large and easily removable.
2. Prepare the mold. Oil it if you are the first person to use it that day (3 in 1 oil) clamp together the two sides of the mold with the ingot clamp and turn the mold so that the form that you want to use is closest to your body. Shim up the opposite end of the mold slightly with a pair of tweezers. (This allows air bubbles out of the mold more easily as you pour your metal).
3. Put your (reasonably) clean metal in the melting dish (aka crucible). Using the acetylene torch with an oxidizing flame, or the mini torch with the rosebud tip, hold the flame about two inches above the metal in the crucible. We want to create an “oven” as we heat... That is, we don’t want any hot spots, just an even heat (be patient!)
4. We want to heat the metal until it resembles mercury, or like “quicksilver”. At this point add a dash of borax flux. “swish” it around in the crucible by gently jiggling the handle of the crucible. Always keeping the heat on the metal, we want to “swish” and heat until the borax disappears.
5. Get ready to pour! This may sound silly, but just think for a few seconds to prepare yourself. Your pour needs to be clean and quick and if you think about it and visualize it first, it makes it much easier and you will be much calmer. It can be a bit intense; after all we are using molten metals at very high temperatures.
6. Time to pour! Always always always keep your flame trained on your metal as you pour, as it enters the ingot mold, and even a bit after... it is still sliding into place a

second after. Sterling silver, gold, and other hard metal jewelry alloys will freeze in an instant; that is, as soon as the flame leaves it. Heat the spout of the crucible up, then return the flame to your metal. While lining the pouring spout up with the ingot mold opening, use a swift pouring motion and pretend the torch is attached to the crucible, keeping the flame on the metal.

7. Open the mold carefully, it's hot! Sometimes a bit of flux from the crucible will follow the poured metal into the ingot mold. That's ok. Try to snap it off if it's a pretty big chunk, and then pickle your metal. Pickle it even if it doesn't appear to have flux on it.

### **Preparing and Rolling the Ingot**

1. File and soften your ingot. When we go to roll the metal, we don't want the metal to "fold in" on itself, so file off any seams and if there are any pockets, soften them too. Sometimes it is necessary to totally cut off one or both ends of the ingot if they are quite ragged.

2. Roll baby! It is likely that your ingot is too short and thick to work with, so we need to roll it out. Using the rolling mill, gradually work the metal down with the wire-rolling end of the mill. \*\*\*Very important! Anneal always. Roll about 2-3 times and anneal in between. Watch for splinters coming off your metal. If you have splinters or splits, this means you need to anneal more or that you are rolling too aggressively. File and sand these splits off. If large splits occur at the end(s) cut them off, there is no other trick to saving your metal from that. It is time consuming to roll and anneal frequently and properly, but it is much more annoying when your metal begins to splinter.

### **Roll Printing**

Roll printing is a great method for texturing soft sheet metal (silver, gold, copper, brass). A sheet of metal is fed into the rolling mill with a textured item such as feathers, dried leaves, or burlap, and the texture of the item is embossed upon the metal.

Things you will need:

- sheet metal (it is hard to work with a super tiny piece... maybe at least 1 inch square)
- textured item to emboss
- Rolling mill
- Protective sheet metal

1. Anneal your metal to make it nice and soft for imprinting. Even copper! Depending on what your project is, 22-18 ga would work well. Keep in mind that when we emboss the metal, it will also roll it a bit thinner, so you may want to gauge down. Also keep in mind

that whatever object(s) you are using to do the roll printing will likely be destroyed in the process.

2. Pickle your metal well. This is easier to do now than after. Sometimes the mill seems to press oxidation into the metal, making it harder to clean.
3. Make a “sandwich” with your metal, your imprinting object(s), and the protective sheet metal. (We absolutely do not want anything touching the metal roller of the rolling mill other than our jewelry metals and the “protective sheet metal”, which is usually made of brass)
4. Adjust the tension of the mill by guessing the roller’s set and feeding just the very end of the “sandwich” until you can feel quite a lot of tension. Then roll it all the way through. You can even roll more than once, with different objects too. Just keep in mind that if you do a second roll the first one will look mellower. Anneal in between!
5. Now you have nice textured sheet that you can use however you please!

## **Freeform Prong Setting**

Prong setting is very common and often the first type of setting that enters people’s minds when discussing stone setting. Traditional prong setting is incredibly finicky and is most commonly used on a premade setting that has already been cast. These directions for freeform prong setting still use concepts that are applied to a traditional setting but are easier to practice and, in my opinion are more fun.

Things you will need:

- A stone. This can be pretty much any stone, since we don’t have to worry about smooth edges or regular forms, it is fun to use ones that look like little slabs or ones with a nugget sort of shape.
- 20 or 22 ga. Sheet
- Wire for prongs (usually 18 or 16 ga. depending on the “look” you are going for or to suit the bulk of the stone you are using)
- Material for a bail, ring shank, or other bits that you would like to attach.

1. Cut your sheet out to either have a tight perimeter to match your stone or to have a loose border. If the perimeter matches your stone’s edge, you will be fabricating a setting with outset prongs, if you are making the latter, then you will be making a setting with inset prongs.

2a. Outset prongs: You have cut your sheet to match the perimeter of your stone. Using a needle file, (the three square works best), notch out an area on the edge of your sheet wherever you want a prong to be. Usually four prongs is minimum, but you may want to add more for interest.

2b. Inset prongs: You have cut your sheet a bit larger than your stone's perimeter. Using a drill bit the exact same size or a bit smaller, drill holes where you want your prongs to be. You may want to mark them out with a sharpie as your stone is lying on your sheet so you can be more exact. Drill your holes and if the drill bit was a bit smaller, ream the holes out until the wire fits in the hole snugly.

3. Cut wire for prongs. We need extra here, cut about  $\frac{3}{4}$  of an inch for each one.

\*\*\* You can do a mixture of inset and outset prongs... Be creative!

4. Time to solder. Using the soft firebrick to our advantage, lay your sheet down and shove your prong wire into the firebrick through the holes you drilled (inset) or by nesting in the notches you made (outset). Flux. Either lay hard solder chips beside each prong or use the pick soldering method to flow solder around each prong. Direct your heat to the base of the prong, and heat around it rather than on it, as it is easy to overheat the wire itself.

5. Trim the excess wire off the back of your piece that was created when we pushed the wires in the brick. File and sand the back and perimeter. Don't worry about the prongs just yet.

6. Solder your ring shank, bail or any other bits on with EASY solder. Yes I know usually we would go to medium now, but we really don't want our prongs to fall off. So just to be safe, we will go to the lowest temperature of solder now. Pickle well.

7. Now you may choose to do a bit of polishing before the stone goes in. It is really easy to catch the prongs on a buff, so using a small freedom buff will help control that.

8. Now we set the prongs. Lay your stone in the setting. The prong will look way too long. That's ok for now. Take a sharpie and mark the OUTSIDE of the prong just where the top of the stone ends. It is better to mark a bit higher than lower, so if you are not sure go for a bit higher.

9. Remove the stone. Transfer the outside mark to the inside of the prong. Trust me... this extra step really helps to more accurately mark the place where we want the prong to bend later. Remove stone and take your three square needle file (triangular) and file a tiny

wedge into the inside of each prong, totally parallel to the base of your setting, about 1/3 of the way through the prong.

10. Trim the prongs with your cutters. I find it really hard to guess the length until you start to bend the prongs down, but you can trim and/or file them after too anyway, so make sure they are not too short to hold the stone in well.

11. With the stone in, start the bend with a little inward pull from your chain nose pliers. Then take the prong setting pliers that look somewhat like a bird's beak and "crush" the prong down and into place. By this I mean hook the larger jaw under your setting and press down with the smaller jaw on the end bit of your prong. We are not really doing a twisting action like we usually do with pliers, we are more using leverage to bend. You may have to go back and forth with the special pliers and your chain nose to get a nice straight prong set.

12. You can adjust your prong length now if they still seem too long. Carefully trim with cutters or file with a barrett file (which has a safety edge). Your prongs do not necessarily have to be blunt; you can round them or taper them so they look like talons. Be creative!

13. Polish the prongs carefully, use the small foredom buff again and soften the tips of the prongs, just don't get them hooked on the buff...your piece will go flying! All done now... time to wear and enjoy!