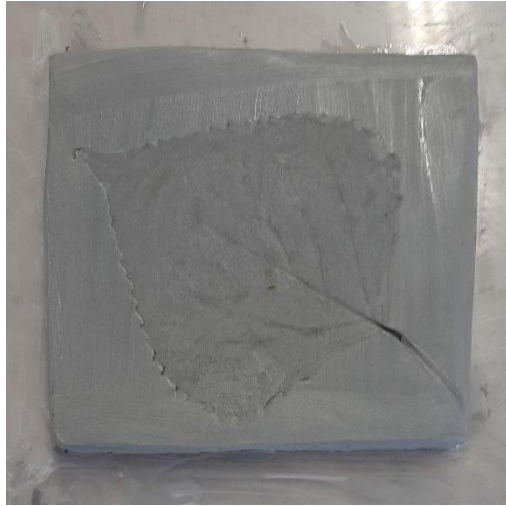


Glass Casting Workshop Notes – Christy Haldane

One Part Mold - Casting with a Clay Positive

Creating a Clay Positive



1. Create a clay positive with pottery clay. Build a reservoir that is larger than your intended piece, so you have extra room to add the correct amount of glass to your mold. The void created by the clay positive will not fit all the glass you will need.
2. Since you are making a one-part mold you must be able to get the clay out of the mold with your fingers or other tools. Keep it simple as you learn.
3. Fill small gaps in the clay so the plaster is not too thin because it can break off causing you to lose detail or contaminate your glass with bits of plaster.
4. The smoother your clay is the smoother your finished glass piece will be.



5. Once your positive is ready it is time to pour your mold.
6. Your clay can float so make sure it is securely stuck to your board.
7. You can use various methods to contain the plaster to create your mold. Box molds are shown above. Flexible plastic sheeting can make a round or oval mold. You will need approximately an inch of plaster around your clay positive.
8. If you use boards and clamps, slowly tighten each clamp so they exert equal pressure on the boards. Do not over tighten them or they will create a gap and allow plaster escape.
9. Use a clay to seal the corners and the bottom of the box so there is a seal between the box and the board.
10. Add a release agent to the interior of the mold box and the board. Vaseline, liquid hand soap or cooking spray are a few release agents you can use. Do not panic if you forget to add mold release, the setting plaster will release water so you will probably be able to get your mold off your board.

Mixing and Pouring the Plaster

1. 1-part Pottery Plaster : 1-part Silica : 1-part Water – I use the same sized container to measure each component. This keeps all the measurements consistent and makes it easier to estimate how much plaster you will need for future molds.
2. Measure of the plaster and silica in a dry pail and mix thoroughly.
3. Measure of the water that will be needed. The warmer the water is the faster it will set and the colder the water the slower it will set. Room temperature water is the best – 22° Celsius.
4. Prepare to pour your mold on a level surface.
5. You will want to have a bucket of water ready to clean your bucket of mixed plaster and your hands. You can not pour plaster down your sink or it will set in your pipes and destroy your plumbing.
6. Have a small amount of plaster to throw onto any plaster that escapes your mold if it starts to leak.
7. Begin adding the plaster/silica mix to the water. Slowly sprinkle the dry mixture around the edge of your bucket. You will do this until all the dry mixture is added and islands begin to form on the surface of the water. Once all the plaster is added, allow the plaster to absorb the water, do not start mixing until the plaster is completely wet.
8. The plaster will not start setting until you start mixing and agitating it. Wipe the side of the bucket to get rid of any dry plaster and start stirring. Make sure it is completely mixed to a smooth uniform consistency.
9. Tap the bucket on the floor to get rid of air bubbles. You can scoop off the foam, brown bubbles that may form on the surface of the plaster and dump it into your water bucket.
10. You can start pouring the plaster when it starts thickening to the viscosity of paint.
11. Drip a thin layer on the face of your clay positive and blow hard on the plaster to force the plaster into the details and remove any bubbles you may have on the surface of your clay.
12. Once the surface is covered, start pouring the plaster into the area around the clay. Let the plaster flow over your clay; do not pour the plaster right on your positive.
13. Cover your clay positive with about an inch of plaster. (this is the bottom of your mold)
14. Once the plaster is poured you need to shake your mold to remove air from the plaster. Carefully vibrate the mold by shaking the board to get bubbles to raise to the surface.
15. If the plaster begins to leak, throw dry plaster onto the leak and it will set up the escaping plaster.
16. Allow the plaster to set up for about 40 minutes and then release your mold from the board. This should be relatively easy with a little pressure, steadily push and turn your mold.
17. Once your mold is free, flip it over and start removing your clay. Be patient and do not gouge your mold or destroy any details on the surface. Run water into your mold and carefully remove any leftover clay. Q-tips, paint brushes and patience are your friends. Your mold should be nice and white when it is clean of clay.
18. Save your clay sculpture but not the clay you used to create your reservoir. The weight of your clay multiplied by 1.25 will give you the weight of the glass you will need to fill your mold and cast your positive.



Prepping Glass

1. Places to order compatible coloured glass - <http://www.bullseyeglass.com/>, <https://oceansidecompatible.com/pages/products> - both companies create tested-compatible glasses for fusing and casting within a kiln and have great online videos and technical support.
2. When casting with reclaimed window glass, it is best to use the same pane of glass for each casting.
3. This is a good resource to understand the Coefficient of expansion (COE) of glass https://www.bullseyeglass.com/images/stories/bullseye/PDF/TechNotes/technotes_03.pdf
4. Clean your glass before crushing or filling your mold.
5. Fill your mold with the amount of glass you need. The weight of your clay multiplied by 1.25 will give you the weight of the glass you will need to fill your mold with enough glass.
6. You can also use the water displacement method to figure out how much glass you need. It is the same as measuring butter when cooking. Put your clay in water, mark the water level, remove your clay and add glass until you reach the mark you made when the clay was submerged.
7. Put your mold and glass in the kiln. A layer of sand on your kiln shelf protects your kiln if your mold breaks and allows you to level your mold. Use a level to get your mold as level as possible.
8. Once your kiln is loaded, you are ready to fire.

Firing Schedule

If your mold is still wet, you can dry your mold in your kiln. Hold your kiln at 150° Celsius / 300° Fahrenheit over night. In the morning send your kiln up to 600° C / 1112 ° F and hold for another hour to burn off chemical water. This is very stinky, and you need to vent your kiln room and crack your kiln during this time so that the vapours can escape the kiln.

Annealing Programs will differ, depending on the size of your work but this is my regular schedule for window glass for smaller molds that will create a glass sculpture that is approximately 4 x 4 x 2. Once you get thicker your annealing times increase exponentially.

The annealing temperature also varies depending on the glass. Window glass is 512° C / 953° F. If you order glass from a glass manufacturer, you can find their annealing temperatures on their websites.

To melt the glass ramp as fast as you can to 870° C / 1598° F

Hold 870° C/ 1598° F for 4 hours to allow all the glass to melt and squeeze out any bubbles.

When the glass is melted into your mold, drop the temperature of your kiln as quickly as possible to at 512° C / 953° F – you crack the lid of the kiln to release the heat quickly, the drop in temperature will stop your glass from devitrifying/crystalizing.

Once at 512° C / 953° F for hold for 4 hours

Ramp to 400° C / 752° F over 8 hours

Ramp to 350° C / 660° F over 3 hours

Ramp to 100° C / 212° F over 9 hours

Let the kiln drop to 40° C / 104° F then crack the lid so it can drop to room temperature before removing the molds from the kiln and breaking them open.