Connecting Old Techniques with New Ideas

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SFA ART

Abstract

Metalworking is an ancient field that provides numerous methods to create a similar outcome. This semester I've been studying several traditional techniques in jewelry making while attempting to incorporate my own designs. The techniques that I have been focusing on are casting and stone-setting. For casting, I have been experimenting with both lost-wax casting and sand-casting in order to create thoughtful, one-of-a-kind works. Casting is often the best method to use when creating organic designs. My designs include snakes and historic Viking imagery that is often easier to create by carving wax and manipulating sand molds.

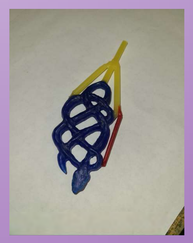
The inclusion of precious stones brings color and vibrance to my original works. I particularly enjoy the process of problem solving in order to design a finished work that allows me to capture a precious stone as the final step. Experimenting with stone setting requires research from technical jewelry books, advice from other jewelers, and mimicking methods used in instructional videos.

Doing this experimentation while still at the university will help prepare me for continued work after graduation. By expanding my "tool belt", I can continue a career of making unique works.

Lost Wax Casting

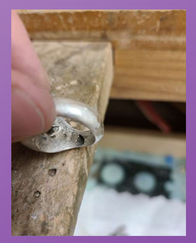
Lost Wax casting is a technique where a three-dimensional object is carved out of wax. The entire technique starts with the carving process. There are multiple ways to carve in wax. For this project, I researched carving with hand tools. Once the waxes are complete, orientation is chosen, and wax sprues are added to the wax pattern; this will be how the metal will flow to the pattern near the end of the process. The wax pattern is weighed, and calculations will be made based on specific gravity. The wax form is mounted to a rubber base that is surrounded by a metal flask. Liquid silica investment is vacuumed and poured into the flask to harden. The rubber base is remove and the flask is placed in the kiln to melt the wax pattern. Now a void is created in order to melt molten metal into using a centrifuge casting machine. After the investment is hardened, you burn out the wax over an 8- or 12-hour period to create a hollow space where the wax was for the molten metal. After casting molten metal into the mold, starts the cleanup and repair process.



Repair Process

During casting, there are several times when cast forms fail to flow completely. In one of my castings, there was a large pit that went completely through the band of the ring. The repair process is like that of fixing a cavity. I had to drill the pit open and tapered a spare sprue- piece of cast metal- to fit it in the hole. Once the piece is tightly secured in the hole, I soldered the pieces by surrounding the sprue with hard solder that melts at roughly **1425** °F. After all the pits are filled, I clean and finish the work by filing, sanding, patinating, and tumbling.







Cracked Stones

Sometimes when you are setting a stone, mistakes happen. The most common mistake is scratching the stone that you are trying to set. Luckily, I have not scratched a stone (yet), but I did have a bigger mistake happen. One of the stones that I was trying to set, a topaz, fractured while I was working on pushing the bezel over the edge. Even though I was not able to finish that specific piece, I still learned from my mistakes and tried to change how I was doing that style of setting in order to be successful. What I believe happened was that during the first attempt of setting that stone, I encountered a problem in the casting that I was previously unaware of causing me to have to discard that project. Due to the failure to set it in the original piece, I believe that the stone was weakened causing it to fracture when I pushed at just the right spot.




Stone Setting

Stone setting, a cold connection technique, allows the maker to "trap" an object in place when heat can't be utilized. There are multiple stone-setting processes that can be used to satisfy the desired design. The settings that I researched were the basic rub over setting, flush setting, and prong settings. When setting a faceted stone, you need to make sure that you have a seat for the girdle, the outermost edge, to sit on properly. This allows you to be able to make sure that your bezel or prongs are at the correct height. The are several different burs that are used in stone setting, but the most common are the round bur and the setting bur. For prong set stones, due to the small scale, I purchased settings and modified them in order to incorporate the stones into my design. Stone settings are done with extreme care in order to avoid scratching the stone or your piece. My resources included working with my professor, learning from local jewelers, reading detailed instructions in multiple technical books, and utilizing YouTube videos as well as Instagram posts. By combining the strategies of many makers, my own style came through while finishing the work.






Sand Casting

Sand casting is a form of casting where you can make a mold of almost anything that you want to replicate. For sand casting, you use petroleum-based sand called delft clay. Firstly, you take your mold frame and split it in half and place your original pattern in one side of the frame. Then using a fine wire mesh, you grate the chunks of clay over the pattern; this will produce a finer sand that will allow the sand to stick together and keep the pattern free from imperfections. After your piece is covered with the fine sand, you pack in the rest of the sand and hammer it to condense the sand. Next you flip it over to where your piece is facing up in the sand, you sprinkle some baby powder over it the ensure that the mold doesn't fall apart in the next step. Fitting the pieces of the mold frame together, you repeat the previous steps of applying the sand. After that is done, take the mold apart to remove your piece. Once you have removed your piece, draw lines away from your piece and poke holes through the sand to create air vents. Place channels and an open cavity where you will pour the metal. This gives the metal a direction to flow to the pattern. Finally, once all the previous steps have been completed, it is time to put the mold back together and pour your molten metal into the empty cavity.