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Casting in Cuttlebone



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If you have comments or suggestions about this project, please feel free to email me. I would love to hear from you.

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History



Cuttlebone is the chalky internal shell of a ten legged, squid-like mollusk known as the cuttlefish. It has a hard, thin crust on the outside which surrounds the internal softer shell. The soft side is composed of a calcium carbonate, which is almost pure calcium. Domestically, the bone is used by parakeets and canaries as a bill sharpener and can be purchased at most pet stores. In powdered form it is used as a polishing agent.

Cuttlebones are found on beaches after sea storms and until recent years were seen, hung by a string on the walls in goldsmith's workshops. Cuttlebone casting is an ancient technique that was used in Mediterranean countries for centuries. Belt buckles made by German goldsmiths have been found dating before the seventh century. Since then, this method was employed throughout history from Italy to Greece, from France to England. Until the end of the 1950's it was utilized by the largest gold manufacturers in the world for mass production. With the perfection of centrifugal casting, the cuttlebone technique became too time consuming and is no longer used by industry. Today, cuttlebone casting is mostly used by artists and craftsman. I absolutely love the spontaneity of the process. There are numerous ways to create a mold for cuttlefish casting. The procedure outlined is the direct method of carving into the bone. This is a simple, low-tech process which can be completed from start to finish in less than an hour.

Please read through entire tutorial before you begin this project.

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What You Will Need



Materials

Cuttlebone

Sterling scrap / casting grain



Tools

Concrete block

Carving and marking tools (pencil, dental tools, paint can opener, awl, square tubing, round tubing, etc.)

Wire cutters

Soft Brush

Masking tape

Acetylene torch with a large and small tip

Fireproof surface with adequate ventilation

Fireproof brick

Respirator

Crucible

Casting flux



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Be Safe!



Wear a respirator! The dust from the cuttlefish shell is extremely hazardous for your lungs—wear a respirator to filter out dust and other toxins, and sweep up and remove the dust from the studio when you are finished carving. I like to do my carving outside so the dust does not settle in my studio.

Ventilate! When casting, proper ventilation is necessary to remove the fumes emitted from the flux, torch, and burning bone. Cuttlefish casting has a distinct, strong, fishy odor—you'll definitely want to ventilate.

Cuttlebone Preparation



1. Large cuttlebones can be purchased from jewelry suppliers, small from pet stores.



2. To prepare mold for casting, divide cuttlefish bone in half by carving a straight line with an awl. Determine centerline and score. Make several passes into line with your awl until a groove is cut completely through the soft side of the bone and you can feel scraping against hard shell. Next, break shell by snapping it along score line. Shell should break evenly in two.

Tip: if you want a large cast, use two shells and remove only the top 1/4 section of each shell.



3. Place soft surface down on a concrete block and rub in a circular motion. Hold bone firmly and apply a light, even pressure as you rub.

Tip: Any rough, flat surface will work. I usually do this on my patio sidewalk. A concrete driveway would also be good.



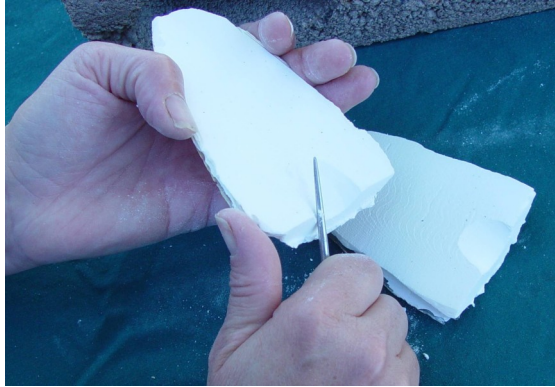
4. Continue to remove material until each half has a flat, smooth plane. If outer shell begins to scrape on concrete, carefully clip that area of shell with small wire cutter.

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5. Using your awl, carve a sprue into each half of mold, leaving an opening $\frac{1}{3}$ the width of upper surface. From top to bottom, carving should measure less than 1" long. Make sure it has a smooth, gentle taper.



5. Carve a shape into cuttlebone. Carve only into one side of mold, leaving remaining section flat, except for sprue opening. For carving, you will need a tool with a flat edge. I like to use a paint can opener for this as it seems to work well to attain a level surface. I like to carve the border first and then remove interior area.

Tip: Do not carve too deeply or the casting will be very thick and difficult to use. Try to keep the carved depth less than $\frac{1}{16}$ " - about the same as an 18-gauge piece of sheet metal.



6. Add texture as you like now. I used an awl to create the lines and a pencil for the domes.



7. Dental tools, square or round tubing, the end of a paintbrush, or ink pen all make interesting designs. Experiment with what you have available.

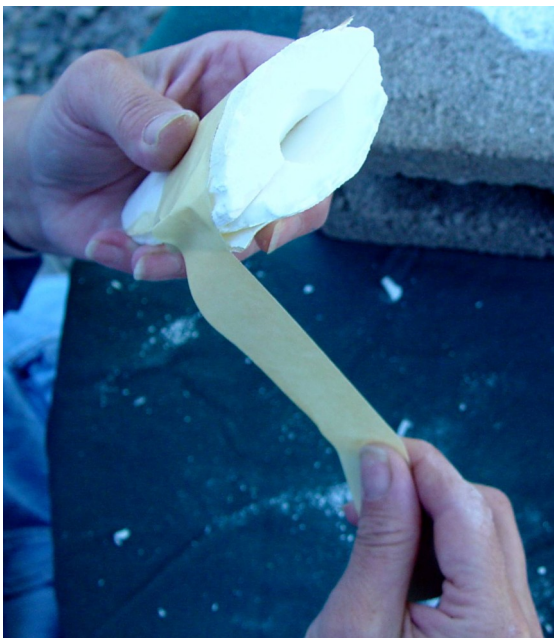
Tip: I learned this carving technique from Chuck Evans, and it sure adds a unique texture to the casting.



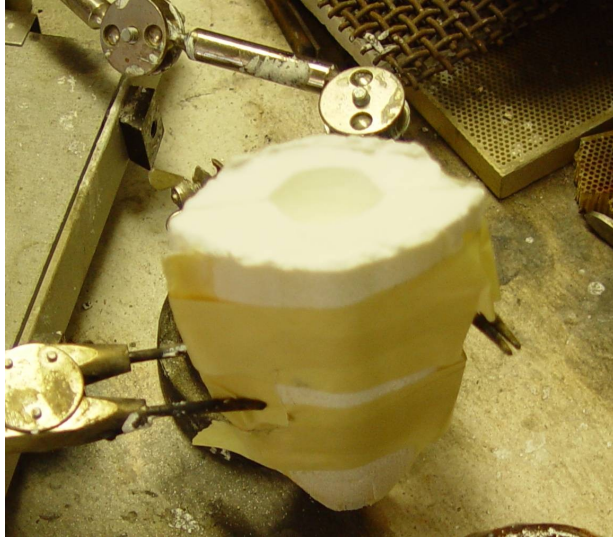
8. Once pattern has been carved, add three or four carved vent lines to bottom of carving with a pencil. The lines should be deeper at the edge of the design and fade to a faint line at base of mold.



9. After carving is complete, use a soft brush to remove dust and loose material. For a well-defined casting, firmly brush both sides of mold to ensure it is clean and dust-free.



10. Hold both sections of cuttlefish mold together and firmly secure halves with masking tape. Make sure tape tightly holds the bones together with no gaps or spaces where molten metal could escape.



11. Secure mold firmly in a place where it will not tip. Whatever holding method you choose must be secure, fireproof, and placed on a fireproof surface. Proper ventilation is essential..

Tip: Methods I have used to secure the mold include: Bury the mold halfway in a coffee can filled with sand / place the mold between two bricks / (shown) hold it in place with a third hand apparatus.



12. With a large tipped acetylene torch, preheat crucible until glowing red and then add metal.

Small pieces of sterling left over from other projects, including old sterling chains, rings, etc., make fine scrap; otherwise, casting grain can be purchased from a jewelry supplier.



13. Heat metal until molten.

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14. Once metal is molten, add a small amount of flux with a steel tool. For a small casting, less than 1/8 teaspoon is sufficient. Flux helps keep metal clean and aids metal to flow as it is poured into mold.



15. Ensure that pouring edge of crucible is red hot, so metal doesn't cool before entering mold. Pour molten metal into mold, being careful not to get fire too close to casting. Be sure to keep torch aimed at crucible until all metal has been poured. Smell will be quite unpleasant and you will be thankful for proper ventilation.



16. When cool, remove masking tape from piece to reveal your casting. Dispose of mold and clean metal with dishwashing detergent and a brass brush. The final casting is now ready to be used in your jewelry design.

Troubleshooting:

1. Metal does not flow all the way to the bottom of the mold: Metal was most likely not hot enough when it entered the mold. Make absolutely sure the metal is completely molten and the pouring side of the crucible is a **glowing red**.
2. Metal flows through and out the bottom of the mold: Mold faces are not completely flat or mold faces are not securely connected with masking tape.
3. Detail is blurred: Mold was not adequately cleaned and cuttlebone powder remained in crevices.
4. Too little or too much metal: Estimate metal needs based on the size of your mold. This is not an exact science. Over time, you will develop a natural sense of how much metal is needed.
5. Key to success: HAVE FUN.....

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Whether you choose to create a piece using only silver cast in cuttlebone or decide to incorporate small pieces of metal in your design, you will have an original, one-of-a-kind piece of jewelry. I like to make pieces that include, mokume, silver wire, and reticulated silver.

Have fun with the project. Please send any comments or suggestions. I would love to hear from you.

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