



By Ed McCormick, ALI

EASILY DUPLICATE DECORATIVE HARDWARE

Now there is no excuse for not restoring or updating that memorable piece of furniture stored away in the attic or that old house project because it is missing a piece. There is no need to search antique stores or salvage yards for the missing hardware or applique, either. You don't even need to find a foundry to reproduce that unique metal pull. Because you can easily duplicate any missing piece in metal, wood or marble, providing you have a piece to copy, with materials from the company whose motto is, "Reproduce Anything."

The technique used is *cold casting* and it is surprisingly simple.

EnvironMolds has been producing environmentally friendly molding and casting materials since 1998. They claim they have a product for any application. We put them to the test by creating decorative replacement hardware in a variety of metals as well as in wood in this project. It was as easy as they claimed it was, too.

To begin with we assembled the materials that we needed along with parts we wanted to copy. These included an engraved antique brass knob from a set of doors that had one missing



Step 1. assemble your materials. You will need a 1-Pint kit of MoldRite25 and AquaClear resin along with brass powder, mixing cups and mixing stick. You will also need a hot glue gun and a gram scale to weigh out the MoldRite25 silicone rubber.

LIST OF MATERIALS

MOLD MAKING

-] MoldRite25—1-Pint Kit
-] Hot Glue Gun
-] Razor or X-Acto Knife
-] Mixing Containers
-] Mixing Sticks
-] Gram Scale

-] Vibrator (Sander)
-] Oven

CASTING

-] AquaClear Resin 1-Pint
-] Brass Powder 325 Mesh—1 lb.
-] Mixing Containers
-] Mixing Sticks
-] 000 Steel Wool

-] Vibrator (Sander)



Step 2. We placed a small dab of hot glue on the bottom of our part.

as well as a glass door knob and a wooden bureau pull from an 1870 maple veneer bureau. The materials included AquaClear resin, a water clear polyurethane resin, KastEZ an opaque ivory colored resin, and MoldRite25 a two-part silicone rubber, all three products by EnvironMolds.

We used EnvironMolds' bronze, brass, mahogany, oak and marble casting media. In addition, we required a gram scale (we purchased a mailing scale at Staples) to weigh out the silicone. We also needed a few 16-ounce and 32-ounce cups, some mixing sticks and a glue gun.

No Air Bubbles

One of the difficulties of mold makers is the fact that

ELIMINATING AIR BUBBLES

Air bubbles in molding and casting materials will cause unsightly surface blemishes. Professional mold makers use vacuum chambers and pressure pots to drive out air. However, satisfactory results can be achieved through the vibrating of your materials as they set. You can create a simple vibrating table by attaching a vibrating source to a table or table leg. In this example to the right we used electrical wire to fix an electric sander to a table leg. When the sander (no sand paper is attached) is turned on the vibrators are strong enough to lower the coefficient of friction in the various casting or mold making liquids to allow any trapped air to rise to the surface and dissipate.

It is important to use such a table in making your hardware duplicates. Small parts tend to trap more air than larger ones. This is especially true when you cast in clear resin. If you don't have a system to reduce trapped air you will have unsightly air bubbles making what you hoped would be water clear, very cloudy.





Step 3. The knob was secured to the bottom of a container with the hot glue.



Step 4. We measured out Part A of the MoldRite 25 using the gram scale. We wanted enough material to cover our knob about 1/2-inch higher than the highest point. Since we were using the same container as our mold box to pour in Part A it was a simple matter of filling the empty container to the same level mark that would equal 1/2-inch above the knob. Once filled to the correct level we noted the weight.



Step 5. In a separate cup we measured out Part B of MoldRite 25 Part B is 1/10 the weight of Part A. We almost forget to account for the weight of the cup. By placing the empty cup on the scale and pressing the 'tare' button the scale automatically set itself zero and the weight of the cup was then accounted for. We measured out 10 grams of Part A and 1 gram of Part B.

air introduced into liquids while mixing can and will interfere with mold making and casting. Professional mold makers use pressure pots and vacuum chambers to eliminate air bubbles. We learned a studio trick from EnvironMolds that accomplishes almost the same result.

We attached a power sander tool to the leg of a table using some electrical wire. (See opposite page) When turned on, the sander vibrates the table and in turn the mold or casting material. Any vibrating tool will do.

The vibrations drive out the air bubbles as they rise to the top of the mold. Don't forget this important step or you will have imperfect results. If you don't have a vibrating power tool, turn on the washing machine and place your molding and casting containers on top. Wash and mold make at the same time.

Making the Mold

We used a glue gun to attach the original knob to the bottom of a container. There should be at least an inch distance between the outside of the container and the closest part of the knob.

Now we are ready to mix the silicone rubber to create the rubber mold. MoldRite 25 is mixed at a ratio of 10 parts of A to 1 part of B. For this we use a gram scale. If the silicone is not accurately measure the material will not set.

We estimated the amount of part A needed to cover the knob to a depth of 1/2-inch higher than the highest part of the knob. This came out to be about 10 grams of part A. We then put a clean cup on the scale and poured out 1/10 of the amount we poured out for part A. In this case it was 1 gram of part B. We can't forget to account for the weight of our containers when we measure either.

Setting the Tare Weight

To account for the weight of the containers we placed the empty container on the scale and pressed the tare weight button. This adjusts for the weight of the

container and the scale now read zero. If there is no tare weight button we would have to weigh the container and then subtract it from the total weight.

Mixing and Pouring the Mold

When the MoldRite 25 was mixed to an even color without marbling we were ready to pour it into the mold. To further eliminate the possibility of air bubbles EnvironMolds' advised us to pour at an exaggerated height in a very narrow stream by squeezing the cup to make a narrow spout.

We also poured in one spot allowing the MoldRite 25 to envelope the knob. This pushes out air. We poured enough to cover the knob 1/2-inch deeper than its height.

The good thing is that if we were short material, not to worry. We could simply mix more MoldRite 25 without having done any harm to our mold making.

Once we finish pouring, we placed the container on our vibrating table and allow it to be vibrated for about 30-minutes or so.

MoldRite 25 takes about 3-hours to solidify before it is ready to be demolded.

Demolding

When the rubber has set the finished mold was remove it from the container. We had to need cut open the container to do so. Then to extract the knob from the rubber we turned the mold over so that the location where we hot glued the knob to the bottom of the container was facing us. Then we took a sharp razor knife and carefully sliced down opposite sides of the mold (about 2/3rds of the way.) See Step 8. Once both sides had been cut we spread the mold open like a clam shell and removed the knob.

We inspected the mold for any loose particles and then closed using a rubber band to keep it tightly shut. We have now created our first finished mold.



Step 6. Once Part A and B are measured combine the two parts and mix until you have an even color with out any marbling.



Step 7. After mixing well, we poured into the mold container in a long narrow stream. We poured in one spot letting the rubber envelope the knob. This drives out more air.



Step 8. When the mold rubber has set, we sliced open the mold with a razor or X-Acto knife. We cut opposite sides and 2/3rds of the way down .



Step 9. The mold was spread open the like a clam shell to remove the original part.

All resins dislike moisture. It will cause resin to foam up or worse, to improperly set. . . Season molds and powders in the oven to dry any moisture.

ing us. Then we took a sharp razor knife and carefully sliced down opposite sides of the mold (about 2/3rds of the way.) See Step 8. Once both sides had been cut we spread the mold open like a clam shell and removed the knob.

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Seasoning the Mold

We then seasoned the mold by baking it for 3-hours at 200-degrees F. This strengthens it and evaporates any residual alcohol. The alcohol, if left in the mold could interfere with the surface of the casting material. In addition, a cast sets better in a warm mold. So it serves three purposes.

Making the Casting

To create the brass casting we poured out equal parts of Part A and part B of AquaClear water clear resin. It is just a simple matter of comparing the levels of each in two cups and making certain they are both the same. In a third cup, we spooned out an equal amount of the 325 Mesh (that is a very fine grind) brass



Step 10. The mold was baked in the oven at 150-200 F° to outgas any residual alcohol remaining in the mold.



Step 11. To create a brass casting these we needed 325 Mesh brass powder and AquaClear resin along with some cups and mixing sticks.



Step 12. We measured out equal parts of Part A and Part B in two cups.



Step 13. We then spooned out brass powder in a third cup to the same level we measured for Part A and Part B of AquaClear resin.



Step 14. We added half the brass powder to Part A and the balance to Part B and stirred well.



Step 15. Part A and Part B was combined in a separate cup and thoroughly mixed before it was poured into the mold.



Step 16. Once the cast was set we removed the cast knob and polished with 000 steel wool to expose the brass surface.

powder. So we had three cups all filled to the same level.

Since AquaClear dries fairly rapidly especially in a warm mold (5-minutes) we will mixed half the brass powder in part A and the other half in part B. Both cups were mixed thoroughly as the powder was heavy and tended to fall to the bottom. Once we had mixed both cups well, we combined one into the other, It doesn't matter which. Then we mixed thoroughly again for about 45-seconds.

To start our pour we removed the mold from the oven (careful it was hot) and carefully poured in the brass mixture until it was filled to the top.

The casting was place on the vibrating table to be vibrated as we did when we first made our mold. Since this set quickly we found that it only took 3-4 minutes of vibration.

Once it was set to the touch we waited another 30-more minutes before attempting to demold.

forward. We remove the rubber band and spread the mold apart to pop out our finished casting. It was almost perfect in spite of a bit of flashing That was an easy clean up using a our X-Acto knife. We also cleaned up any evidence of seam lines this way.

some triple-0 steel wool we polished the knob to remove the resin and expose the brass. We could have also used a buffing wheel for even shinier results.

The finished product was an extraordinary copy of the original brass knob. It was very difficult to distinguish it from the original with one exception. The original had a darker patina from age. A little time oxidation will remove any such differences.

The results were so spectacular that we decided to replace all of our kitchen cabinet hardware with these 19th century brass reproductions. We were able to create 18 more brass knobs from the same mold with the same detail.

(more)



The duplicated brass knob is on the left. The original is on the right. The original still has a worn lacquer surface which adds to its antique look. In time the duplicate will oxidize to a similar patina.

Demolding

Demolding was fairly straight

Finishing

With a little elbow grease and

COMPOUND CASTING

Reproducing Glass and Brass Door Knobs



We created a door knob mold using the method on the previous pages. AquaClear resin was mixed and poured to the level of the glass door knob being careful not to fill above the line where the brass connects. Then we vibrated



Once the AquaClear was measured out the brass was apportioned, combined and mixed.

The procedure for recreating this piece of hardware—a glass knob with brass hardware attached seemed a bit perplexing at first. Frankly, we discovered that it was as simple as creating the brass knob casting. All we were doing is casting twice into the same mold.

The first 11 steps were identical to creating the mold for the brass knob. We secured the glass knob to a molding container with hot glue. We then mixed and poured MoldRite25 silicone rubber into the container covering the knob at least to a 1/2-inch depth.

After the mold was set we cut it open as before and removed the knob. We then seasoned it in the oven.

We used the same material for the casting as shown in Step 11. That is, we used AquaClear



We filled the mold with the mixed brass casting material all the way to the mold opening. We then vibrated the casing until it set.



After the brass cast was set we removed knob from the mold and cleaned up the flashing. And polished the brass with 000 steel wool.

resin, brass powder, some mixing cups and mixing sticks.

Once the mold was removed from the oven we poured equal parts of AquaClear resin into two separate cups. We didn't use the brass powder in this step as we wanted to achieve a clear casting.

One cup was poured into the other and mixed well. A good way to know if we have mixed long enough is to watch for the mix to turn from cloudy to clear.

Now here is the cautious part. We had to pour the mixture into the mold only up to where the brass hardware was. We needed extra light to see into the mold and we used a small flash light for this part.

We continued to check the original to see where the glass stopped and the metal began and then peered into the mold to be certain we had poured to the correct level.

Once we were certain we had poured correctly, we place the mold on the vibrating table and turned on the vibrating source for ten minutes or so. We found that the AquaClear resin set fairly quickly so more vibration would not be effective.

We allowed at least three hours for the AquaClear to thoroughly set.

Then we were ready to cast the brass. This is the simple part because all we needed do was mix equal parts of brass powder with equal parts of Part A and Part B of the AquaClear resin and fill the mold to the top.

We again placed the mold on the vibrating table and let it vibrate for about 15 to 20- minutes until the casting began to set.

The casting was to sit for three hours before demolding. After demolding we found we had to clean up the flashing. But the duplicate was a perfect copy.

(more)

LIST OF MATERIALS

MOLD MAKING

-] MoldRite25—1-Pint Kit
-] Hot Glue Gun
-] Razor or X-Acto Knife
-] Mixing Containers
-] Mixing Sticks
-] Gram Scale

-] Vibrator (Sander)
-] Oven

CASTING

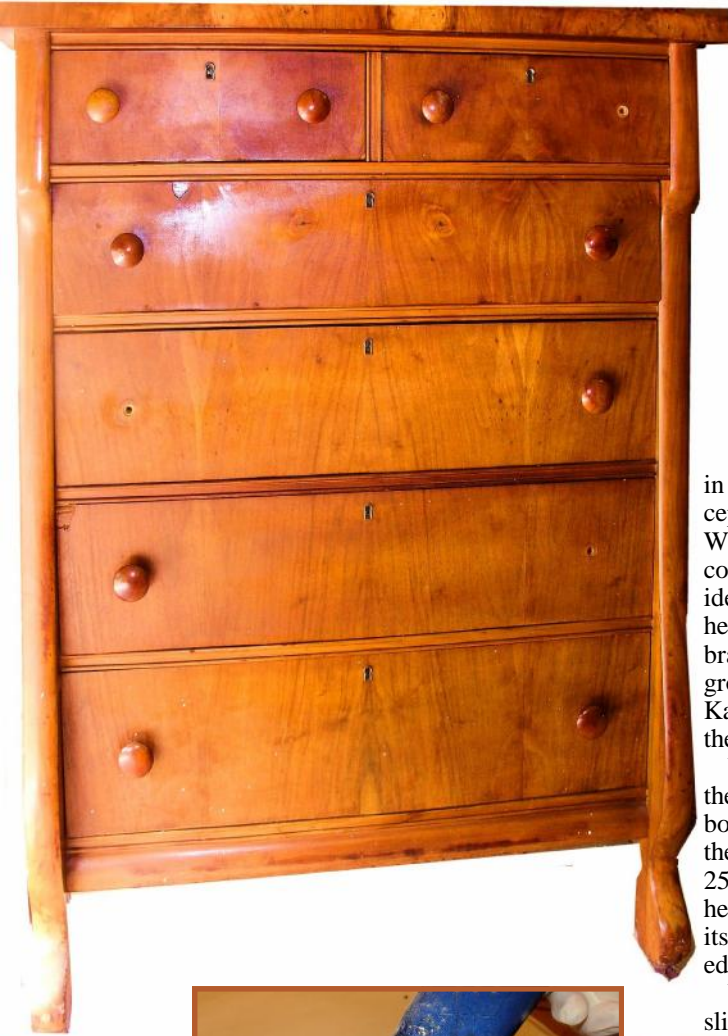
-] AquaClear Resin 1-Pint
-] Brass Powder 325 Mesh—1 lb.
-] Mixing Containers
-] Mixing Sticks
-] 000 Steel Wool

-] Vibrator (Sander)



The duplicate glass knob along with the original sitting on its mold of MoldRite25 RTV silicone rubber.

DUPLICATE MISSING WOODEN KNOBS



Then there is grandmother's 19th bureau in perfectly good condition except for some missing knobs. Well we were now confident we could fix that using the identical methods described here. Except instead of using brass powder we will use ground pecan shell powder and KastEZ resin so we can match the color of the wood.

We unscrewed a knob from the bureau and hot glued it to the bottom of a small container. We then mixed up some MoldRite 25 and covered the knob to a height of about 1/2 inch above its highest point. We then vibrated it to rid it of air bubbles.

When the mold rubber set we sliced the mold open to remove the original knob and baked the mold to season it.

At the same time we baked some pecan shell powder in the oven to rid it of moisture. The instructions suggest baking about 3-hours at 150-200° F.

Mahogany or Oak?

Casting wood requires a bit more finesse than casting other materials as wood colors vary a great deal. However, Environ-Mold's points out that a serviceable look of oak or mahogany can be achieved by substituting the resin. Using AquaClear resin and pecan shell flour will result in a mahogany wood tone.

Using KastEZ resin, by itself it sets to an ivory tone, with pecan shell powder you can achieve a satisfactory oak or maple tone.

We did both even though our bureau was a maple veneer.

Casting the Wood Knob

When the mold is ready follow the procedure you used to cast the brass knob. That is, measure out equal parts of Part A and Part



A dab of hot glue was placed on the back of the knob.



The knob was secured to the bottom of a mold container. Here we used a cut off plastic cup.



MoldRite 25 is mixed and pour on top of the knob to create the mold.



The pecan shell powder is dried in the oven along with a number of molds.



After mixing 1/3 dry pecan shell powder with 1/3 Part A and 1/3 Part B of resin, the mixture is poured into the mold.



The mold is vibrated as the material sets. Once set, the mold is opened to reveal the finished duplicated knob.

B of KastEZ or AquaClear resin and an equal part of pecan shell powder. The formula is 1/3rd flour, 1/3 part A and 1/3 part B.

We premixed the flour by dividing the pecan shell powder in half, between Part A and Part B. Then we mixed one half in Part A and one half in Part B in the KastEZ resin.

After mixing thoroughly we then added both mixtures together and continued mixing. It doesn't matter which part we poured into the other.

After mixing all the material together for about 45-seconds to one minute, we poured it into the wood knob mold and vibrated it. We waited about three hours before demolding.

After removing the finished knob from the mold clean we cleaned up the flashing and polish with 000 steel wool to remove the resin and expose the wood.

We could have stained or painted the knob to better match an original. However, with several coats of we achieved an excellent copy just as promised.

LIST OF MATERIALS

MOLD MAKING

-] MoldRite25—1-Pint Kit
-] Hot Glue Gun
-] Razor or X-Acto Knife
-] Mixing Containers
-] Mixing Sticks
-] Gram Scale
-] Vibrator (Sander)
-] Oven

CASTING

-] AquaClear Resin 1-Pint or
-] KastEZ Resin 1-Pint
-] Pecan Shell Flour 325 Mesh—1 lb.
-] Mixing Containers
-] Mixing Sticks
-] 000 Steel Wool
-] Vibrator (Sander)

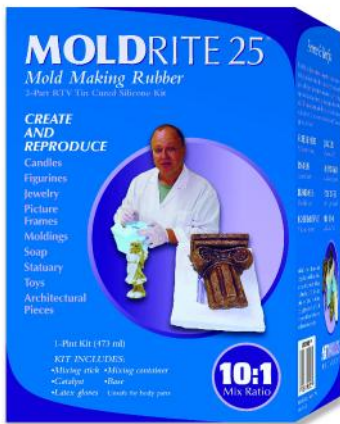


The original and two copies of a wooden bureau knob along with the silicone mold. One copy was created using KastEZ resin for the oak finish, the other with AquaClear resin for a mahogany look.

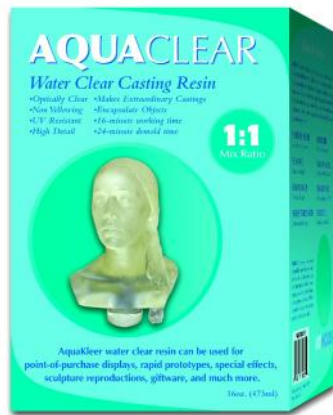


MOLDING & CASTING PRODUCTS

Here are the EnvironMolds' mold making and casting products utilized in the duplication of the hardware in this article. With them you can reproduce a wide variety of objects in a technique called *cold casting* in bonded metals of all types, simulated glass, marble and even wood.



MoldRite25 silicone contains everything you need to make an easily to release rubber mold.



AquaClear is a water clear resin used to simulate glass and as a bonding agent for metals and other media.



KastEZ Resin is an opaque white resin used to simulate ivory, porcelain and used for bonded wood.



Left: EnvironMolds offers 5 high quality and very fine ground 325-Screen mesh casting media. This includes copper, brass, bronze, marble and wood powders to create cold casting which duplicate the original.

By mixing 1/3rd by volume of any of the casting media with 1/3 Part A and 1/3 Part B of either AquaClear or KastEZ resin a simulated hot foundry metal or other material may be achieved.

FOR PURCHASING INFORMATION PLEASE CONTACT:



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