

SHIPWRIGHT'S APPRENTICE

Using polymer clay for ornamentation

by Chuck Passaro



You have probably marveled at the carving skills of 18th century masters when visiting a naval museum. I am sure you have admired the intricately carved details of a figurehead.

Some ship models have an abundance of finely carved and elegant scroll work. Sometimes these elements are gilded or painted or left in their natural state. One of the most intimidating aspects of ship modeling is how to approach carving these details. The carved elements on these contemporary models were most likely carved out of English boxwood. One alternative however, might be to sculpt these details rather than carve them. Sculpting a figurehead from polymer clay affords you the opportunity to continually tweak your work before curing it. When carving out of wood, a mistake can be much more difficult to fix. It usually requires that you start over rather than remedy the situation. Wood can easily split and crack and adding additional wood material to correct a deep gauge or misplaced cut would certainly show up on an unpainted figurehead.

I recommend experimenting with some polymer clay like Sculpey® or FIMO® (Photos 1 & 2). These clays come in a variety of colors that can be mixed. Sculpey also comes

in metallic colors like gold and bronze and after being baked the ornamentation would not need to be painted. The gilded effect is quite nice and the most intricate

details are not lost by painting them. In the case of Sculpey, there are several grades of clay that have a different sculpting texture and consistency. You should choose the right clay for your application on the ship model. I regularly use Super Sculpey or Sculpey III. Super Sculpey comes in a limited color palette but is great to use when very fine detailing is required. This clay is baked in the oven until it hardens. After it cools down the clay can be sanded, drilled and carved. It can be painted and accepts stain as well.



Photo 1. Super Sculpey clay is available in Firm (shown here) and Regular.



Photo 2. FIMO modelling clay.

Sculpey III

It comes in dozens of colors including metallic (Photo 3). It is less brittle after baking. However it captures less fine detail. It also remains somewhat flexible after baking.

Super Sculpey and Super Sculpey Firm

This is a better clay for fine detailing, however it is more brittle after baking. It only comes in “flesh tone”, but can be easily stained. The firm type only comes in dark gray and is also brittle if baked to long or very thin pieces are made. It can be mixed with Sculpey III to make it more flexible and easier to work with. But I do prefer these



Photo 3. Sculpey III comes in a wide variety of colors.

two over all of the others. I wouldn't be frightened away by the brittle nature of the clay. It's not any more fragile than a thin piece of carved boxwood. You need to just handle the work carefully and allow the pieces to cool down entirely after you bake them. If you try and work on a piece further while it is still hot and flexible, it is very much like a freshly baked chocolate chip cookie. It needs to fully harden and cool down or it will bend and distort.

The tools needed to sculpt the ornamentation and figureheads for a model are no different than any other sculpting tools you might find in an art store (**Photo 4**).

They just need to be smaller. Some folks will use dental tools to good effect on small miniature sculptures. Dental varying sized tips can be bought on EBAY® very cheaply (**Photo 5**). Overall the tools are very inexpensive and many can be home made.

Wooden dowels can be tapered and shaped to suit. Shown in the photos are some typical tools. Those with the different shaped open loops are used to remove clay from your piece rather than push it around and texture the clay's surface. I personally use only three or four homemade tools. The work is so tiny that I prefer using a toothpick or a large sewing needle to make the fine details. They are perfect for shaping the facial features of a figurehead. In addition to this I use a stiff paint brush. I use a few different sizes depending on the area being worked on.

If you thin down the clay with a softener (**Photo 6**), you can dip your brush in the softening liquid and use it to smooth out the surface when that effect is desired. I will discuss that further later when I describe how I made the figurehead for my model of the Frigate *Confederacy*.

Some people prefer softer clay to work with and the clay softener I mentioned is available from Sculpey. It is a liquid petroleum solvent and is supplied in small bottles. Just a drop or two on the clay while kneading it with your fingers will soften it up considerably. Softer clay will not hold details as

well as firmer clay. But it has its advantages. I will soften the clay slightly before I use it. If the clay begins to get sticky and difficult to work with simply dipping your tools into water will take care of it. Some sculptors prefer to use corn starch much like a baker would use to prevent the clay from sticking to your tools. But water is the best way to go. Being an oil based clay, dipping your tools in water keeps them free of clay while working on the small details. This will be

important should you decide to create a push mold. You can quickly duplicate your carved pieces using one.

Gun port wreaths and scrollwork can be precisely molded and dozens of copies produced. This is an easy way to start experimenting with the material.

If you are building a kit that has some cast decorations and you are not thrilled with the level of detail and the shape of each piece; Sculpey can be a big help.

Let's say you want to improve the appearance of the cast gun port wreaths. You can take the kit supplied casting and create a push mold.

To produce the push mold just prepare a piece of Sculpey III a little larger and thicker than the piece to be duplicated. Coat the original with corn starch or brush it down with water to prevent sticking. The same should be done with the surface of the Sculpey you will be pressing the original into. Press the original into the clay firmly and then remove it. Be careful not to distort the unbaked mold while removing the master. Bake the mold to cure it. Just like anything else Sculpey can burn if baked for too long so adjust the temperature and time according to the directions given by the manufacturer. The parts we usually make are much smaller than usual. So for really tiny pieces I will pre-heat the oven to 275 degrees. I will bake the real tiny parts for just 3- or 4-minutes. The mold will be thicker however so follow the directions for the time needed based on the thickness of the clay.

With the mold completed it is a snap to create multiple copies of your original. Coat the mold as mentioned above with corn starch or water and then push some uncured Sculpey into it. Remove the



Photo 4. An example of the typical sculpting tools found at any local art store.



Photo 5. An example of dental picks that can be very useful for fine details.



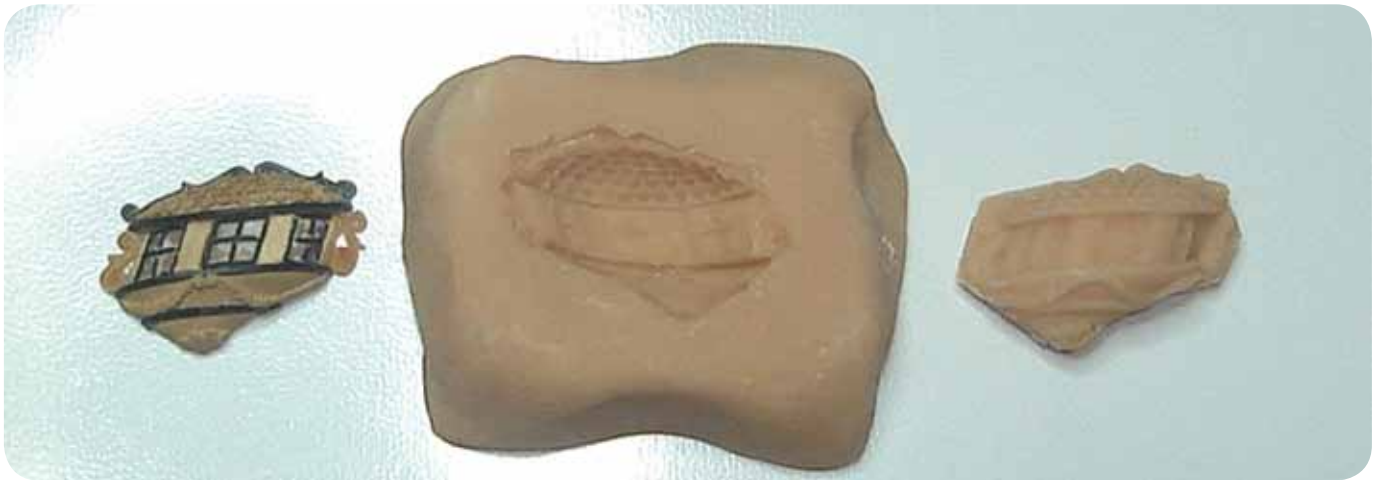


Photo 6. Push model made from Sculpey. The multi-material master is on the left and a newly cast copy is on the right of the mold.

Sculpey carefully and you have a perfectly formed duplicate.

But don't bake the duplicate casting yet. You weren't happy with the original master and now you have an uncured duplicate. You can manipulate and reshape the clay to add extra details and smooth out the surfaces until you are happy. Since the original was the correct size and thickness (hopefully), all you are really doing is tweaking the fine details to improve it. Trim off any excess clay when you are satisfied and bake it. Now you have a great looking piece that can be painted or stained. If the wreath needs to be gilded, then use the gold clay available from Sculpey. If you need more than one then that's easy...just make a push mold for your improved version and make as many copies as you need.

This is the technique I used to create the quarter badges for my model of the US Brig *Syren* 1803. The model was a prototype design for a Model Shipways kit. The kit is now available. But I had to create a master that Model Shipways could use to mass produce them for the kit. It was easier to fabricate the original with mixed media. Wood, wire, clay and whatever else I could

find lying around was used to make the master shown in the photo provided. It doesn't look pretty because of the colors and textures on the original piece. So I took that "ugly" master and created a push mold (**Photo 6**).

on the hull planking. You will probably need to use many coats of stain to get the deeper shades you desire. The window panes were painted black afterwards. You can see how the color of the badge matches the surrounding



Photo 7. The stained quarter badge placed on the model of the brig *Syren*. Four coats of stain on the Super Sculpey matched the color of the planking well.

Photo 7 shows the molded badge after it was stained several times. I used Super Sculpey this time for its pink fleshy color. It accepts stain very well. I used the same color wood stain that I used

planking. The surface of the badge would have been very different had I painted it.

It would also be good to point out that polymer clay can be baked more than once. When

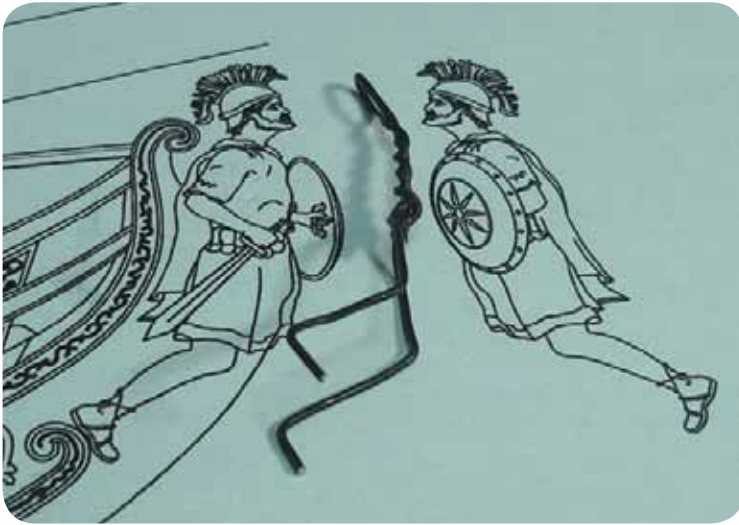


Photo 8. The 28-gauge black wire armature used to support the creation of the figurehead placed against a drawing to make sizing and positioning easier.



Photo 9. Wire armature created for the figurehead with the torso wrapped in foil to give it mass.

creating larger or more complex pieces it is best to complete it a portion at a time. For example, if you were creating a figurehead you could sculpt the torso first and then bake it. This will prevent the torso from being damaged or altered. Then you can add the head and arms to the piece afterwards because the torso will now act as a strong foundation to build upon. Then bake it again. Then add some more details and bake it yet again. This stepped approach will give you some flexibility. The completed sections can still be sanded and carved if they need to be worked on.

Figures for the US *Confederacy*

My latest project for Model Shipways was to design a POB kit of the US frigate *Confederacy*. This frigate is one of the few early American frigates that were highly decorated with scrollwork and figures. We are fortunate to have very detailed drawings of these decorations which makes it easy to create an accurate representation. What didn't seem to easy was the prospect of carving so many figures from boxwood and then casting them to create masters for the mass production of Kit fittings. A much more acceptable approach for me was to use Sculpey. The contemporary "as captured" draft for the *Confederacy* was enlarged so I could make out as much detail as possible. Then I recreated what I thought was an appropriately styled rendering for the figureheads and stern carvings. With this in hand I began work on the figurehead.

The *Confederacy* figurehead is of a Greek warrior holding a shield and sword. It also has a plumed helmet. The figurehead is basically a

full sculpture in the round. It's not a relief panel with a flat backing that is more typical of the stern decorations. For this reason, I usually create a wire skeleton. It's nothing fancy but will help support the clay and keep my figure posed correctly. I used 28-gauge black wire for the simple armature (**Photo 8**). See the photos provided. In addition to the wire armature, I also built another stem to scale and mounted it on a base to make it free standing. I like to sculpt my figureheads directly on the stem. I actually added another piece of wire to the "crotch" of the armature so I could insert it into a hole drilled into the stem. This keeps the whole skeleton and figurehead sturdy while I am working on it. As I mentioned earlier, the clay can be baked many times over. With this set up, I actually bake the figurehead while it remains on the wooden stem. I place the whole thing in the oven. The oven is set at such a low temperature (275 degrees) that there is no danger at all with the wood catching fire or even scorching. If your figurehead starts getting a crispy golden brown then you are baking it for too long or at too high a temperature. You should never see and discoloration from the baking process.

To create a little more mass and get the general shape and pose of the warrior, I wrap tin foil around the armature (**Photo 9**). You can see that no arms were added to the skeleton. I am just getting the general shape of the torso, and the legs are there to help me get the proportions correct. At this point I can start applying the clay. In this case I decided to use Sculpey III. It doesn't hold the details as well, but I want to show the color palette that is achievable. By mixing different colors you can actually create a pretty close match to the wood you



Photo 10. This photo shows the roughing out of the clay to get the proper shape.



Photo 11. This photo shows small amounts of clay being added after baking to create and refine the musculature.



Photo 12 (left). This photo shows the completed head with a facial features and helmet; the legs remain to be added.

Photo 13 (above). The photo of the figurehead after now that the legs have been added. A dime has been added to show scale.



Photo 14. Right profile of the finished figurehead.



Photo 15. Head-on profile of the finished figurehead.



Photo 16. Left profile of the finished figurehead.

are using. This eliminates the need to paint the piece when it's finished. This figurehead won't be used on the model however. I will make a resin copy for my prototype so the original clay master can be used when Model Shipways goes into mass production.

To begin adding clay, I don't worry about the details straight away. You can see in the next picture how I just applied a lump of clay. I roughly shaped it to get the basic shape and size. There are only mere suggestions of any muscles and definition at this point (**Photo 10**). In **Photo 10** you can also see a practice sculpture of the torso only just to the left of the figurehead. It was a quick study that I could use for comparison. Any mistakes I saw in the study were remedied on the full figurehead. When completed the figurehead was baked for 30- or 40-minutes. This hardened the base on top of which the details will be added.

In **Photo 11**, I am adding small patches of fresh clay to the cured

base structure. To help make the new clay stick to the baked clay, I dip a brush in Sculpey softener and apply it generously to the entire torso. I add small lumps of clay that represents the chest and abdomen muscles. Using a toothpick I can blend in the edges of the new clay into the torso and it will stick quite well. To give the surface of the clay a smooth texture, I dip the brush into the Sculpey "thinner" again and brush the uncured clay in the general shape of the muscle definition. Brushing the clay blends the uncured clay into the baked clay and smooth out any bumps and rough spots. Then I bake it again. I repeat this process over and over again. Adding new pieces to the torso each time.

I created a thin rope of clay and applied it to create the warrior's belt. Using the edge of the toothpick I flattened it out and defined the edge between it and the body. It is smoothed and blended by brushing some more Sculpey softener over it. The

torso was probably baked 30 to 40 times before it was completed.

Next I added the head. I simply created an egg shape with uncured clay around the wire armature. Then I baked it. This provided a firm surface to add the helmet and the facial features onto. Each feature was added a little at a time while baking and adding more detail. To sculpt the really fine details like the eyes, nose, beard, hair, and mouth, I use the point of a large sewing needle. The features are roughed in and then smoothed out by brushing it down and blending with the Sculpey softener. If I wasn't happy with how the face turned out or a certain feature, it was easily remedied. I just sliced it off or sanded it off and started over again. I think you are starting to get the picture. Clay is very versatile and forgiving.

The legs, the cape and other details were completed using the same approach. When it came time to add the arms, I drilled a small hole into the stub of each shoulder. I inserted a separate

length of wire for each arm after bending it to get the correct pose. The length of the wire included the sword and the shield. The clay was roughly added to create a solid foundation and the general shape. It was baked so the clay would harden. Then I actually removed the arms by pulling them out of their sockets. I was able to complete each arm including the sword and shield while it was off the body. Then they were baked and finally reattached to the torso. Uncured clay was thinned down with the Sculpey softener so I could use it like glue. It kept the arms posed and firmly in position. Then the entire figure was baked for one last time. **Photos 10 - 13** show the warrior progressing in stages.

Even though I didn't use this clay sculpture on my model because it became the master for mass production, there is no reason why you couldn't. I have used the clay originals many times on my models, and it is a great alternative to wood carving. **Photos 14 -16** show the completed figurehead for the frigate *Confederacy* from different angles.

Stern figures

Creating the sculptures for the stern figures and decorations was very similar but still challenging. The elements are not depicted fully in the round like the figurehead. I did want to give them a very deep sculptural appearance however which would resemble what I admire about the contemporary

models I have seen. No wire armature was needed. To prepare, I created another wooden transom to scale that I could use to sculpt on top of. I created it with the gentle curve "port-to-starboard" that was also present on the actual model. I will sculpt and bake the pieces directly on this transom and use it as base. You can see in the **Figure 1** the stern decorations are made up of seven separate sculptures. Although I have seen kits developed that provide a solid casting for the entire stern transom I decided to develop each of the seven separately. I am not a big fan of the solid one piece transom as they never seem to fit properly.

I wanted to show as much fine detail as my skills would allow so I chose Super Sculpey Firm as the clay to use. **Photo 17** also shows my workbench as I was working on the two initial figures. You can see just how tiny these are. Each one can fit comfortably on a quarter with room to spare. I will also point out that you may have noticed the optivisor in the background. At this size it is an absolute must have tool. I usually spend two hours or so at each sitting and my eyes can get tired quickly. Without the magnification it would be impossible to form the tiny details on the faces of these figures.

Just as did with the figurehead, I started sculpting by adding a rough mass of clay for the torso only. No head or legs. I was just trying to get the correct shape and size I needed. Few if any details were added to the torso at this point. Then I baked the torso so I would have a solid base that I could add the details too. **Photo 18** shows the completed

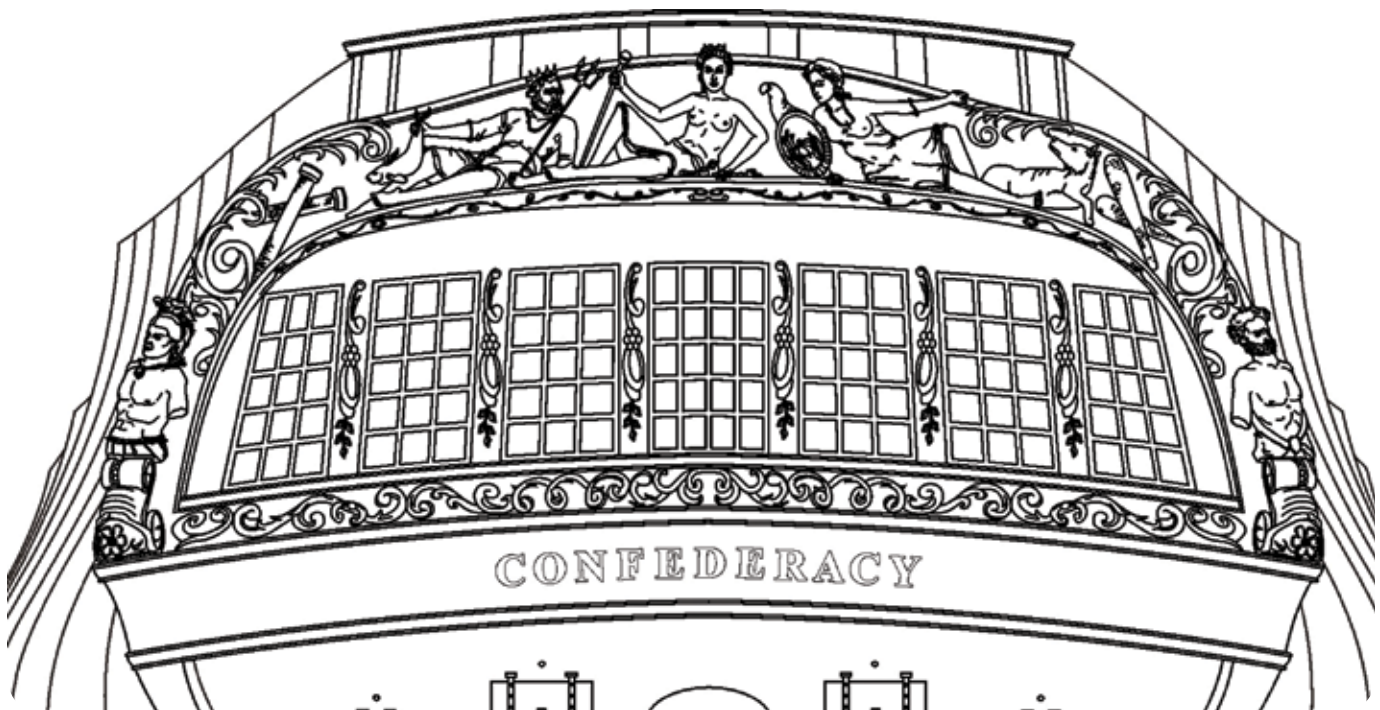


Figure 1. Close-up of the stern figures and carvings on the US *Confederacy*.



Photo 17. My workbench with two initial figures resting on the building transom. You can see just how tiny these are by comparing them to the quarter.

three central figures. To add the finer details, my primary tools were a sewing needle, a sharpened awl and a small paintbrush.

To explain how I created the finer details, similar techniques

were used as described earlier. They were just on a much smaller scale. For example, to make sculpt the breasts and abdomen for the central figure of Hera, the tiniest of clay specs were added a little at a time. You can

see in the photo a small round bead on my fingertip that was eventually used to form them. I applied a thin wash of Sculpey softener to the entire cured torso. This will help the uncured clay stick to the hardened clay. Then I positioned the small spec of clay where I wanted it. I used the tip of a sewing needle to squash the edges of the speck into the surrounding cured clay. Any excess clay that “squished” out in the process was scraped away with a sharp #11 Xacto blade. This did not leave the desired shape and texture I was looking to achieve. I basically had a raised pimple of rough clay with a very odd shape. To work it further, I dipped a small brush in the Sculpey softener and began smoothing out the entire area. While doing so I was actually using the brush to push and pull the clay around to shape it correctly. At the same time the gentle brush strokes were bending the rough edges of the spec into the surrounding torso



Photo 18. Close-up view of finished figures to be placed on the transom.



Photo 19. Close-up view of finished stern with figures in place and painted.



Photo 20. Close-up view of finished bow with figurehead in place and painted.

which was cured. Almost all of the fine details were shaped, blended and attached to the cured base with just the needle and a brush. Once I had some small details completed to my liking I baked the entire piece to lock it in and harden it. Small additions are so tiny that I had to make some modifications to my cooking time. I preheat the oven to 250 degrees and each time I rebaked the clay it was for only 1.5 or 2 minutes. Add more details and then bake it again....

When each tiny sculpture was completed I carefully removed them from the wood transom. The cured clay will stick to the wood but will separate with a little coaxing. I use a single edged razor and gently part the sculpture free. I have included a couple of photos of the sculptures

on the completed model of the frigate *Confederacy*. The actual clay masters weren't used. They would be needed to create the master molds for mass production of the Model Shipways kit. So I created some cast copies of each piece in resin. Those for the kit will be supplied as Britannia metal castings. The resin versions on the prototype were painted with acrylic. I chose to paint them to simulate the look of carved wood. Various thin washes of yellow ochre, raw sienna, titanium white, and burnt umber were used to match the color of the stained basswood as closely as possible. All of the decorations were made this way including the trailboards and drops. There is no reason why you couldn't use the clay originals on your

model since mass production isn't a consideration. They can be painted or you could use Scupey III to mix the perfect matching shade of wood so they can be applied as is.

I hope after reading this introduction to polymer clay you might give it a try on your own ship model. There are a large number of websites and forums devoted to sculpting with polymer clay. A simple search on Google for the keywords "polymer clay tips and techniques" or "sculpting miniatures with polymer clay" will yield hundreds of advanced techniques. Polymer clay is a very versatile and acceptable material for many of our ship modeling needs.

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