

# FORGING AN ALUMINUM VESSEL

By Dave Koenig

Photo 1



**BEGIN WITH A PIECE OF ONE INCH ROUND ALUMINUM STOCK.**

Hand forging aluminum is very enjoyable. Alloy 6061 is common and forges well. It is softer than steel and results in a forging which looks quite different than a similar forging made from steel.

This vessel is an experimental piece.

### **Tongs.**

The vessel described here needs to be forged using a tong. It is better not to use a tong whenever possible. The reason is a tong is just one more thing to think about when forging. And, in the case of forging aluminum, tongs can easily leave unwanted marks on the work.

Photo 2



**TAPER BOTH ENDS OF THE STOCK. LEAVE A 3/8' SQUARE TIP AT EACH END.**

### **Heating Aluminum**

Heat aluminum only until a dry 'paint stick' or a similar piece of wood leaves a brown streak when rubbed on the hot aluminum. Do not hammer on the aluminum if there is any color or if the wood leaves a black smoky streak. Striking aluminum under these hot conditions will result in split or crumbled stock. More on heating later.

From the first two photos it is apparent a coal fire creates a contrasting oxidation. This oxidation will be incorporated in the final finish. In the spreading process these contrasts get dramatic

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Photo 3



FLATTEN THE STOCK ABOUT ¼" AND BEGIN SPREADING. WORK FROM THE CENTER OUT.

After tapering each ends of the stock, the primary forging process is spreading. Start the spreading process by flattening the stock about ¼" with the face of the forging hammer. Use a cross peen in the center of the bar and work equally from the center to each side.

In Photo 3, the results of using a 1"x ½" rounded treadle hammer tool can be seen. As an experiment it was not very effective." At this stage in the forging process the bar is flat.

Photo 4



CONTINUE THE SPREADING PROCESS.

On the next heat flatten the bar another ¼" and continue spreading, Photo 4. The bar is now about a half inch thick and flat.

When spreading it is important to keep an eye on the proportion of the piece. It is easy to concentrate so much on spreading then all of a sudden everything looks crooked

Aluminum moves quickly so it is easy for a few blows to make a lot of difference.

### More on Heating Aluminum

By this time in the forging process you probably got the hang of heating the aluminum and checking it with a piece of soft dry wood.

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Photo 5



THE WALLS  
START TO  
RISE AS  
THE  
BOTTOM  
STRETCHES  
AND  
BECOMES  
THINNER

Hopefully you began to notice that the hammer is a very good indicator of how hot the aluminum is. When the aluminum cools, which it does on a cold anvil rather quickly, it does get harder to forge. The difficulty is not really a problem because the aluminum still remains soft relative to hot steel. Aluminum does work-harden but is a lot more forgiving than copper when it comes to cracking.

During the next few heats the stock will begin to turn up on the ends, the width will get a little wider and the walls will rise automatically. The reason is the bottom is being stretched. The edge of the vessel wall changes very little because the edge of the wall remains thick relative to the thinning bottom.

Photo 6



Continue to spread the bottom and walls to taste. The shape of the vessel in Photo 6 is how it remained as thought was given to completing the finials. With no real ideas about how to work the existing finials, I just continued to spread one end.

The result of the spreading was the shape of the vessel got longer, and a little wider. During this process the entire vessel developed a twist. No attempt to

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Photo 7



straighten the twist using just the hammer peen would correct it. The twist was finally removed over a 5" slightly curved trailer hitch.

As shown in Photo 7 the other finial was drawn out and curled into a handle.

When the vessel was straightened a cross peen and rounding hammer were used to stretch the bottom even more. This

Photo 8



additional forging lengthened the vessel more and defined the interior better.

### **A Final Comment on Heating Aluminum**

Once your hammer becomes the indicator of when to reheat the aluminum, it is very important to heat it slowly. Keep in mind that thin and thick sections are being heated at the same time. It is better to go in and out of the fire until the desired heat is reached than to stay in the fire too long and burn a hole in the piece.

Photo 9



ALUMINUM IS A GREAT MATERIAL TO WORK. HAVE FUN BEING CREATIVE WITH IT!

### **The Finish**

The vessel is finished by refining the edges with files and progressively finer grades of sand paper. It is very easy to hand shape aluminum with files and sand paper compared to steel. The final shaping becomes another opportunity to become creative.

This vessel had a final sanding with 600 grit sand paper and two coats of neutral shoe polish.