

# CUSTOM FUEL TANKS FOR OLD TIMER AIRCRAFT

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*An article published in the January/February 2009 issue of SAM Speaks Roland Friestad. Although PFFT doesn't fly Texaco, the concepts here might be useful to some of our readers*

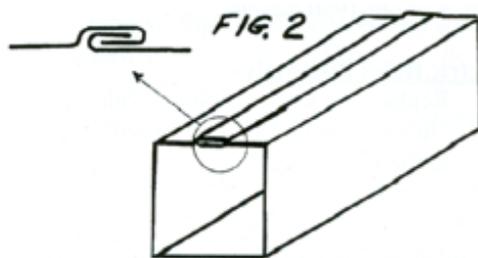
There are many cases where a fuel tank of a particular shape would be required to fit into a limited space available in a particular aircraft, and appropriate commercial tanks are just not available. Also it is particularly useful to have a custom tank to the exact capacity required to satisfy the fuel allotment for the various Texaco classes in SAM competition, 5cc for 1/2A Texaco, 14cc for A-Texaco, or 4cc per pound for Texaco. That way the engine can be started and properly warmed up, and the fuel topped up to the correct fuel allotment just before launch.

It is relatively easy to make a rugged and functional fuel tank virtually any size and shape you want, for any type of aircraft, so rather than try to find a suitable tank, why not make one yourself? Most of my own SAM aircraft have homemade tanks. I use the K & S brass sheet sold in most hobby shops, which not only solders easily and is a light and practical material for a tank for any type of fuel, but also can look very attractive on SAM aircraft where the tank often is visible. The bodies of my tanks are made of .005" sheet and the end caps of .010" sheet.

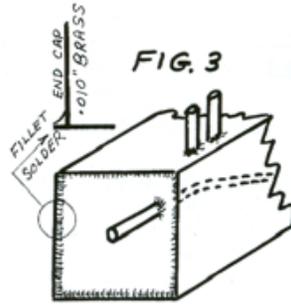
Let's consider the construction of a simple rectangular tank. Suppose we make it for an A-Texaco aircraft, which requires a fuel tank capacity of 14 cc. When capacity is specified in metric units, it is easiest to calculate the dimensions of the tank in centimeters. One way of achieving 14 cc of volume would be a tank 2cm x 2cm by 3.5cm. So to layout a blank for the tank body, mark a strip of .005 brass to the 3.5cm width using a sharp scribe. Now the fold lines can be scribed onto the blank as shown in Figure 1.

To accommodate a lap seam approx. 1/8" wide (or 0.3cm) at the top of the tank, we need to add 3 x 0.3 or 0.9 cm to the length of the blank. Thus the top portion of the tank consists of a "half-top" 1 cm wide at each end of the blank, with 0.3 cm added to one of the "half-tops", plus a folded tab 0.3cm wide at each end. The blank can now be cut out using a pair of scissors. And at this point before doing any folding, I sand the edges and areas that are going to be soldered, and then clean the blank very thoroughly with methyl alcohol to remove any residue or oil film on the sheet.

Sharp folds are easy to make in the .005" brass by using a steel rule or straightedge held tightly against each fold line, and bending the brass over the edge of the rule. One end tab is folded down, the other up, then the folds at the corners of the tank are made, and finally the lap seam formed from the two end tabs to form a rectangular "tube" (See Figure 2). The upper seam can be made very flat by inserting a rectangular bar of hard wood or metal into the tube to use as an anvil, and tapping the seam flat with a hammer before soldering. For soldering, I use lead-free flux-cored solder that is 98%tin, 2% silver, and an acid flux.



A rectangular (in this case, square) end cap can now be cut from .010" brass to fit snugly into the end of the tank, inserting it into the tube about 1/32" and tacking it into place. Then a fillet of solder is applied to all four edges. Now is the time to add the brass feed, filler and vent tubes before attaching the other end cap. Rather than drilling holes for these tubes, it is better to punch holes into the brass sheet using a nail or sharp awl. This creates a dimple on the outside of the tank, and a jagged flange on the inside which, when soldered, produces a stronger mounting for the tube than a drilled hole would. Be careful though not to overdo it, and punch a hole too large to allow the tube to fit snugly before soldering. The pickup end of the feed tube should be tack soldered to the inside wall of the tank, as well as to its tank-entry point. Solder a neat fillet around each tube entry.



The other end of the tank can now be inserted and fillet-soldered, and the tank is complete. If desired, mounting brackets can be cut from the .010" brass sheet and soldered to the sides of the tank. When all soldering is done, the tank should be checked for leaks by plugging the filler and vent tubes, attaching a fuel line to the feed tube, immersing the tank in water and blowing air into it. If no leaks are evident, then fill and empty the tank several times with alcohol or fuel to flush out any flux inside. I usually go one step further and buff the tank to a bright shining finish, turning it into an object of beauty sitting behind a rare classic or antique engine. There is virtually no limit to the variety of custom tank shapes that can be made this way, to fit in whatever space is available on your aircraft or engine-mount assembly. Figure 4 illustrates just a few of the custom shapes possible.

