

Bending Metal

by Roger Cole

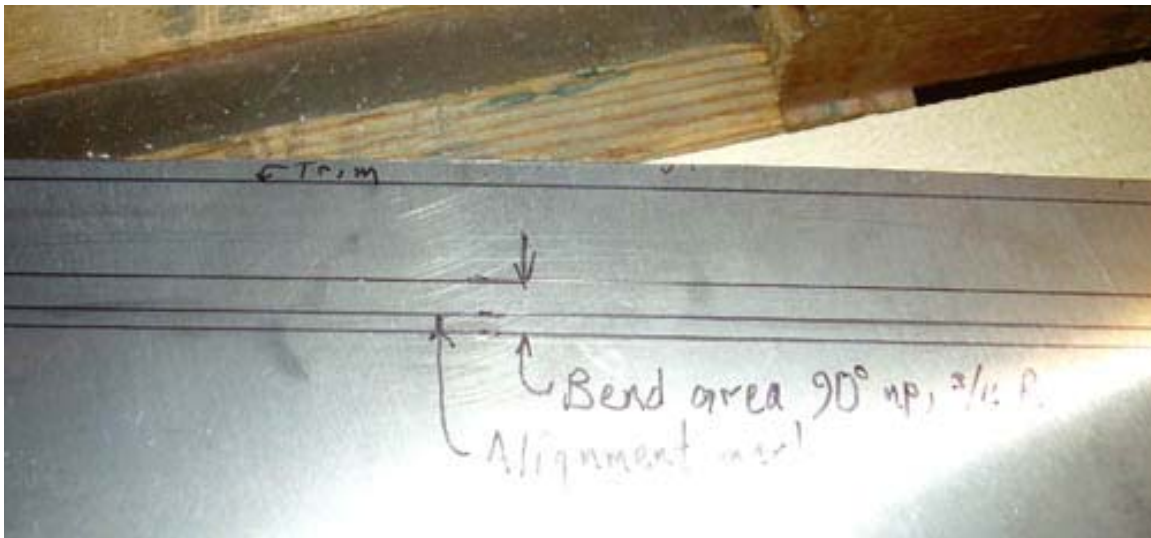
I recently had to bend a piece of 0.063-inch-thick, 6061T6 aluminum that was almost 2 feet long. If you have ever tried to bend that thickness without a brake, you know how much it resists bending. Here is how I did it.

The bend required a 3/16-inch radius to avoid cracking the metal. To make a bending form I routed a notch in the edge of a 2x6. A 3/8-inch diameter aluminum rod with screws at each end fits in the notch. I also cut the edge at an angle to allow for spring-back on a 90° bend. A second 2x6 forms a clamp for the metal.

Next, I marked the area of the bend on the metal. The width of the bend is

$$w = \pi * \text{radius} / 2$$

for a 90° bend. For a 3/16 radius the width is 0.29 inches. I also marked an alignment line 3/16 inch from the beginning of the bend.



I clamped two small pieces of wood to the metal so the edges of the wood were on the alignment line. The pieces of wood are used to align the metal with the bending form and will be removed later.



The metal was set on the bending form so the two pieces of wood rest on the aluminum rod, and the vise was tightened. This procedure ensures that the aluminum rod touches the metal exactly on the line that marks the beginning of the bend.

With the metal clamped tightly in the vise, the two pieces of wood are removed. Two large C-clamps hold the ends of the 2x6s to keep them from spreading under the force of the bending.

A ratchet strap clamped to the top of the metal and running to the back of the workbench starts the bend. A soft-faced, dead-blow mallet does the bending. Hit close to the bend and distribute the blows so the bend is uniform. Thin metal can be bent by hand with the mallet used only enough to wrap the metal tightly around the aluminum rod.



If I were to do this again, I would laminate pieces of plywood together with glue to a thickness of about 2 inches. This would eliminate the tendency of the 2x6s to split along the grain.