Sheet Metal Box: Design and Manufacture

I know this is a terrible rendering

CAD Sheet Metal

SOLIDWORKS has a really useful sheet metal tutorial. I highly recommend doing that tutorial if you haven't designed any sheet metal part before.

The three features I find most useful are **base flange, edge flange, and miter flange**. You can also find specific tutorials about them on YouTube.

Base flange and edge flange are pretty straight forward. Miter flanges are helpful when you are trying to assemble sheet metal.

Lay Out

After you finish designing

1. Unsuppress the *Flat-Pattern* feature.
2. Create a drawing.
3. Insert your sheet metal part into the drawing
4. Set the part ratio to 1:1
5. Print the drawing
6. Spray adhesive on the sheet metal
7. Stick the drawing on it

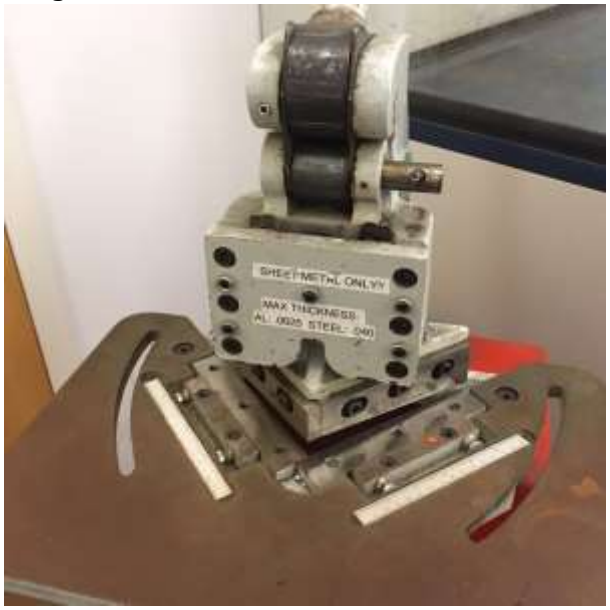
Machine Sheet Metal

First of all, if you need to bend your sheet metal, make sure your parts won't conflict with itself or the brake when you are bending it

There are 3 common things you can do with sheet metal

1. Cut Sheet Metal
   Sheet metal shears come in different scales. In the main shop, you can find a foot shear that is more than 3 feet long. In the lab, you can also see shears that are as small as scissors. You should choose the tools depending on the size and the thickness of your part. The follow is a picture of a medium size shear we have in the lab.

   To make miter flanges, you can use a notcher in either the main shop or the mini-shop. It can cuts a perfect right angle.



2. Bend

We normally use a finger brake to bend the sheet metal. There are three finger brakes on campus. The biggest one is in the main shop, medium one in the mini-shop and the small one in the lab.

If necessary, you can take some of the metal finger off to make it easier to bend your part.

Simply clamping the sheet metal and hammering it is also a way to bend sheet metal.

3. Punch Holes

You can drill or punch holes on sheet metal. Drilling on sheet metal is not much different from that on metal blocks. However, punching holes can save you a lot of hole. In order to punch a perfect hole on sheet metal,

1. Center punch your hole.
2. Put your piece under the punch, and fit the center punch dent into the little bump on the punch.
3. Pull the handle down
4. Put the stripper on your piece
5. Push the handle up
6. Debur

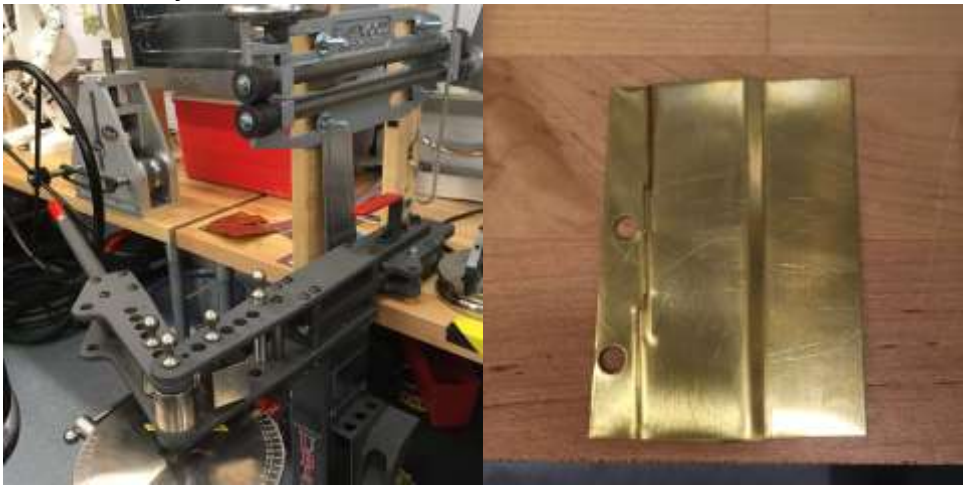
4. Secure

   To secure two sheet metal plates together, install pop rivets with a rivet gun

If you want to screw sheet metal plates together, use rivet nuts. They are like threaded inserts for sheet metal.

You can find instructions on both of the methods on YouTube.

5. More
   Dave also has some other really cool tools that can do really cool things with sheet metal. Talk to him if you are interested.



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Any questions or suggestions, email jingyi.xu@students.olin.edu