Baby’s got the Bends

Making neato bent parts from solidworks® to folded metal
How to get from this… to this…
Solid modeling the part:

These are thin parts, 1/16” thick.
Mirroring one side to the other

Mirror can be found in:
Insert -> Pattern/Mirror -> Mirror feature
Adding the other two sides

Notice the gap here (on the order of your manufacturing tolerance—typically 1mm) It is important that these sides not be joined… otherwise, there would be no way to unfold the part or manufacture it!

Other sides mirrored too!

A note to the advanced Solidworks users out there: The gap here is necessary because of the flaps we’ll soon be adding. Without the flaps, you wouldn’t need the gap… instead using the “rip” tab in the sheet metal feature window.
Now, add the flaps…

Notice this top view!
Mirror twice more… and… Tada!
Make the bends

Select a base plane (in green here)

Choose Insert-> Features-> Sheet Metal-> Bends…
Flatten Bends

The sheet metal thickness is a good first order approximation for bending radius. For accurate values, use experimental values.

Here’s that “rip” tab that was mentioned earlier.
Add a “configuration”

Configurations allow you to have multiple “versions” of your part, with different features suppressed. Very convenient.

Give it an obvious name

This is the configuration tab
Voila! Our flattened part

Note: this is in our “Flattened” configuration
Create a drawing

Insert a top view of the part

Right click, select “properties”
The flattened drawing

These lines show you where to clamp down when you fold the part on the brake.

Select our “Flattened” configuration
Save as a DXF file

DXF is a 2D interchange format. We’ll use it to bring our unfolded box to the OMAX water jet.
Omax will rock your world

Here’s the Omax open dialog (from the file menu). Neat preview, hu?

The next thing we need to do is add lead in and out lines and delete the internal folding lines---we don’t want to cut along them.
Adding Lead in/out lines

Add some small lines for the water jet to start and end
Erasing extraneous lines
Creating a tool path

Click here to create your tool path

Tell Omax where to start the tool path. It will figure out the rest by itself.
Tool path created!
The back room: Omax time
Trim trim trim your way to slimmer thighs… and buttocks

Don’t forget to deburr your parts!
I’ve drilled a hole here to rivet together the box once it’s folded. Why didn’t I drill two holes, one on the other flap? Because it’s impossible to guarantee the holes will line up once folded. Folding is an imperfect operation.

Once the box is folded together, I can use this first hole to locate the second hole!
Folding tidbits

Note that these clamps have been removed to make room for the left and right sides.
Which one is real?