# Sheet Metal - Advanced

Sheet Metal features in ThinkDesign are very flexible.You can not only work with Sheet Metal commands directly from the scratch but also use them in conjunction with Solid modeling commands.This Web training task aims to introduce the advanced Sheet Metal features in ThinkDesign.

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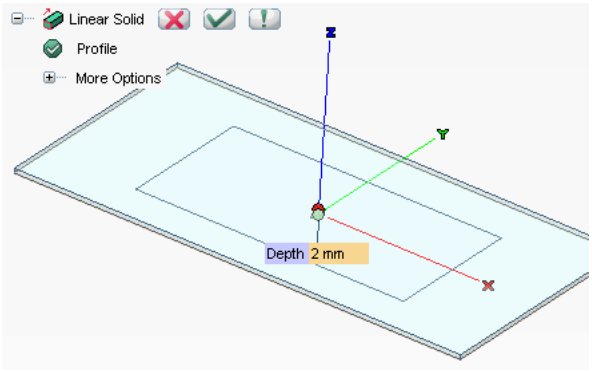
## 1. Step1: First Flange.

Let's begin.

- Open a **New Model**.
- Use **Rectangle** command and sketch a Profile of dimension 100 x 200
- Start the **Linear Solid** command
- Select the Profile and set Depth Value as 2

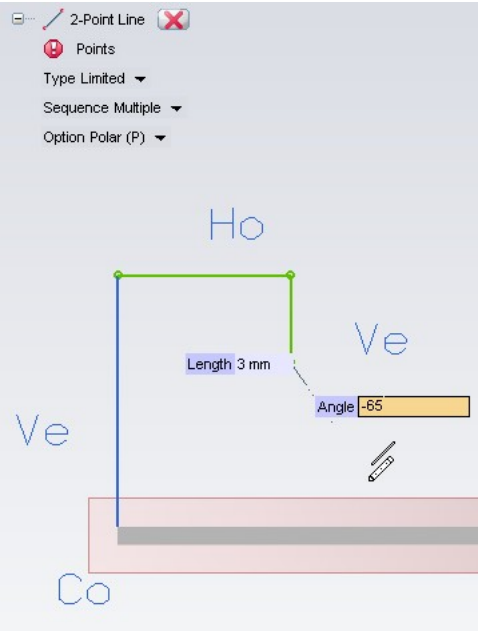



OK.

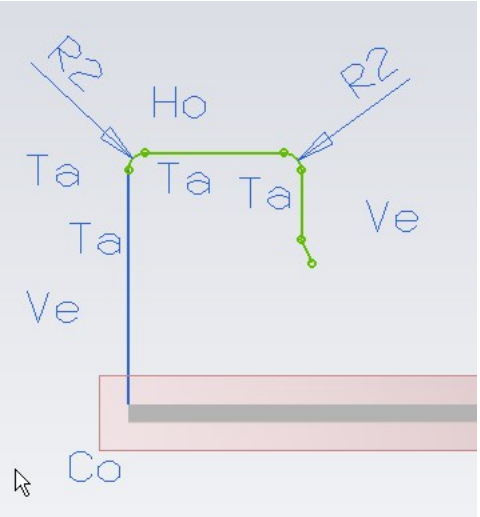
You have the base solid ready.

Let's now set the work plane on thickness face of the solid.

- Right click on one of the lateral faces and and select Work plane to be placed on that face.
- Click on the Profile mode.
- Start the **Polyline** command
- Click on the corner vertex to start and Sketch a profile of dimension 29 X 20 X 10 as shown.



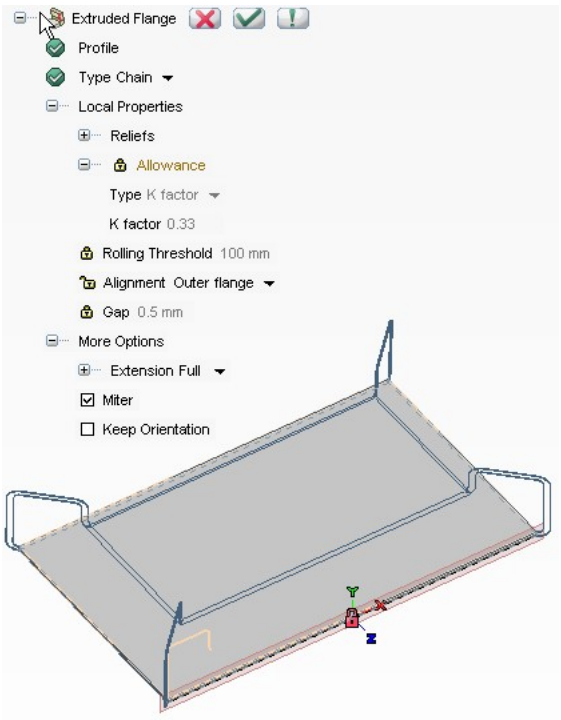

Add a Fillet of 2mm radius to the perpendicular lines.




Let us now create an **Extruded Flange** with the sketched profile running through the chain of edges of the top face of the solid.

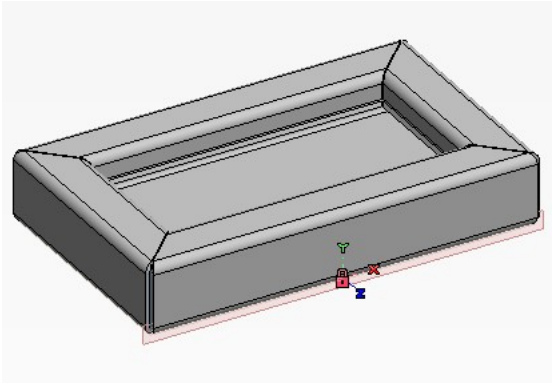
- Start the **Extruded Flange** command.
- Select the Profile and set Type to Chain
- Click on one of the edges of the top face of the solid and they get chained.
- Under More options, check Miter to get the edges closed.

The preview of the Flange is as shown.



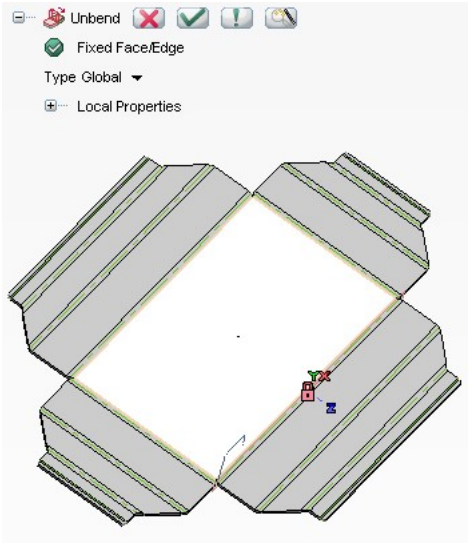

Click OK

The Flange is created.



Let us now **Unbend** this solid and check how it looks.

- Start the **Unbend** command
- Select Bottom face of the Solid as Fixed Face/Edge
- Click OK.

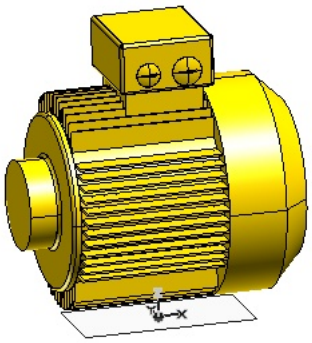



# 2. Step2: More features.

Let's check out a few more features in the Sheet Metal module.

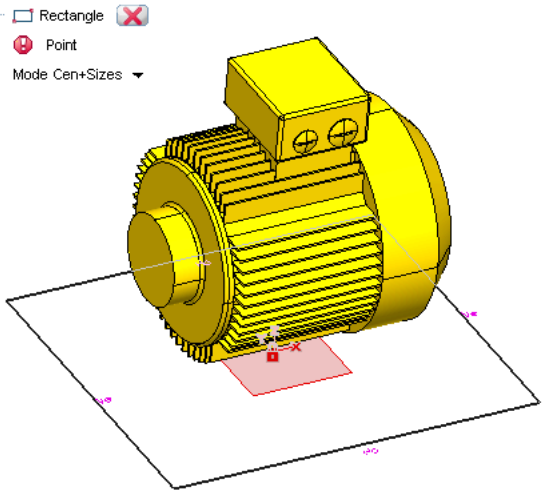
In this Step, we will check how **Face Rip** command works.

- **Open** New_carter.e3. The model file resides in the files folder inside the task folder whereever it is downloaded



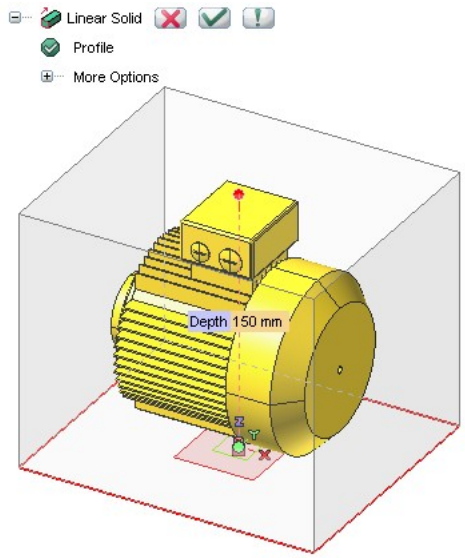
We will first create a **Linear Solid** that encompasses this motor body.

- Click the 2D Profile tab.
- Start the **Rectangle** command and sketch a rectangle of dimension 175X150.




Cancel to exit the command.

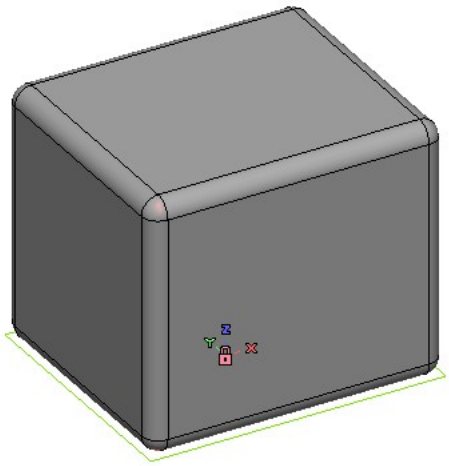
- Start the **Linear Solid** command. The Profile gets selected automatically.
- Pull the Depth Handle and set the value as 150




Click OK

Let's now smooth the corners of this solid with a radius of 10.

- Start the **Fillet Solid** command.
- Select the solid.

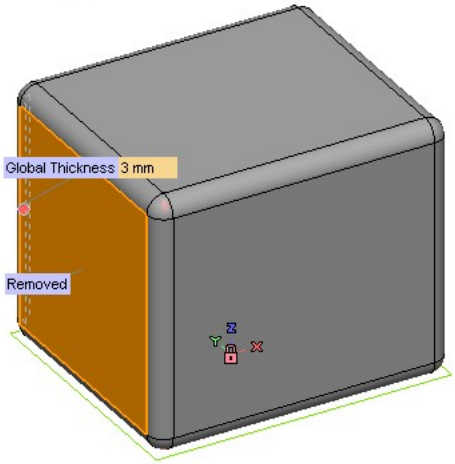


Click OK

The solid is Filleted on all its edges

Let's now add a Shell and remove one face.

- Start the **Solid Shell** command.
- Select the face as shown below for the Faces to be removed.

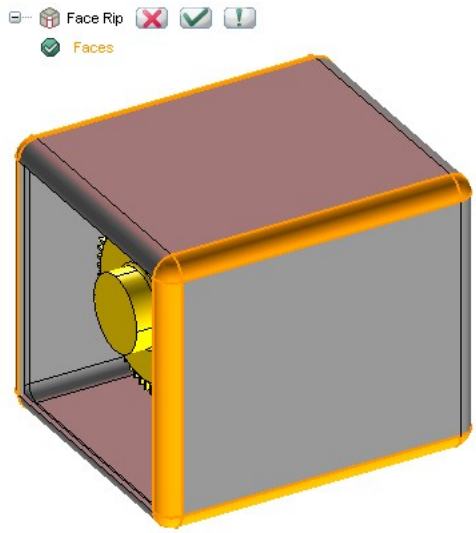




Set a value of 3 for Global thickness.

Click OK

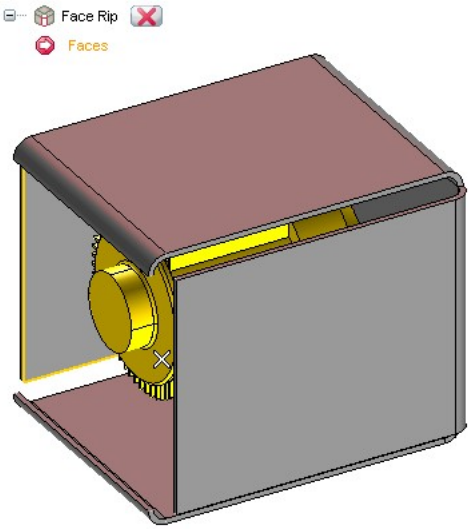
Let's now remove some faces using the **Face Rip** command.

- Start the **Face Rip** command.
- Select the Faces as shown on the Front and back sides of the solid.



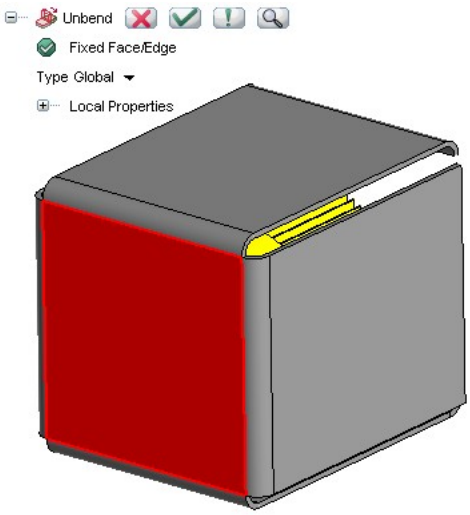

Click OK

The Solid gets Ripped off at the faces selected.



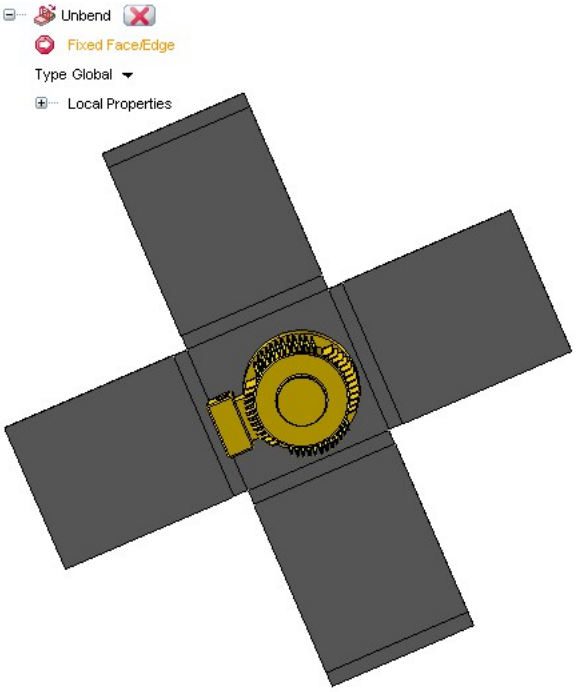

Let's now **Unbend** this solid and see how the development looks.

- Start the **Unbend** command.
- Select the Bottom face as the Fixed Face.




Click OK

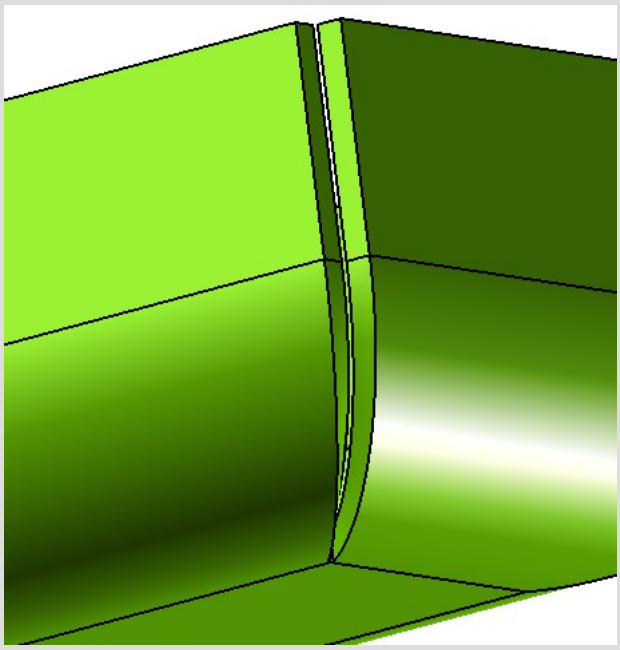
The Solid gets Unbent.




You are now familiar with the **Face Rip** command.

**Note:**

Do you know that from ThinkDesign rev9.0 on, you can Rip cylindrical edges?



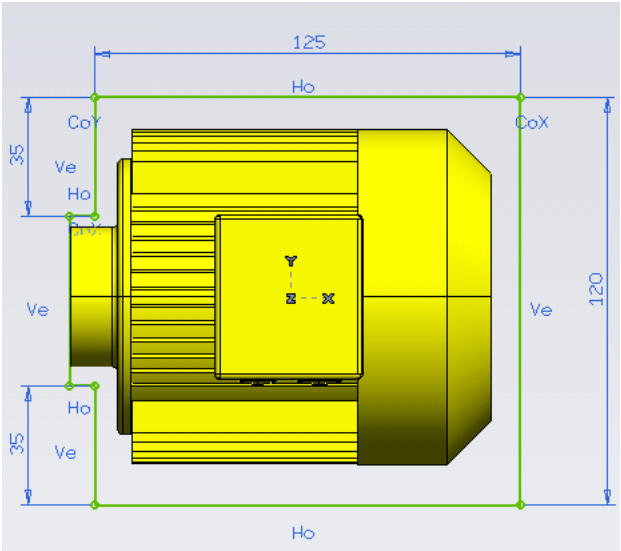
# 3. Step 3: Smart Objects in Sheet Metal

Let's continue showing you few more commands in Sheet Metal module. Also in this Step, we shall see how you can use Smart Objects with Sheet Metal.

**Open** New_Carter.e3.

First let's create a **Linear Solid** to encompass the whole motor.

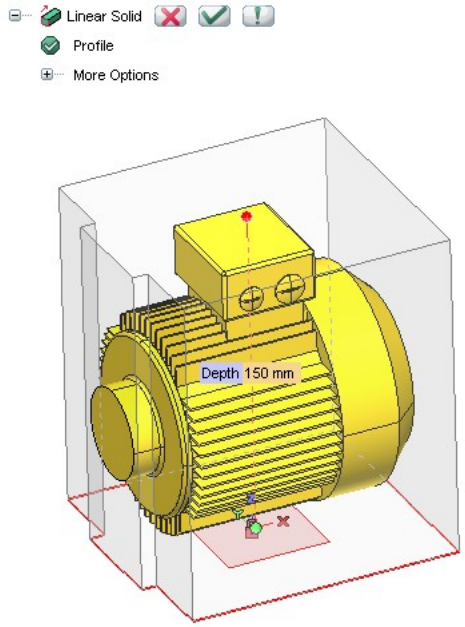
- Click on the Profile tab.
- Start the **Polyline** command and sketch a Profile as shown.




- Start the **Linear Solid** Command.

The Profile is automatically selected.

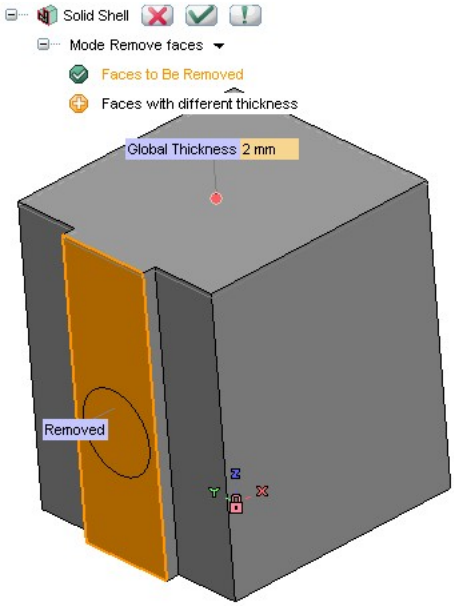
- Pull the handle for Depth and set the value as 150.




Click OK.

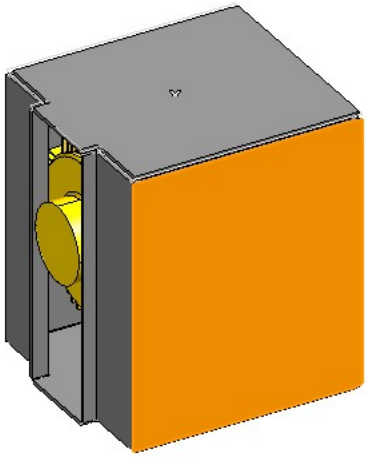
Let's now Shell the solid from the front face.

- Start the **Solid Shell** command.
- Select the Front face as the Faces to be removed.
- Set Shell thickness as 2.

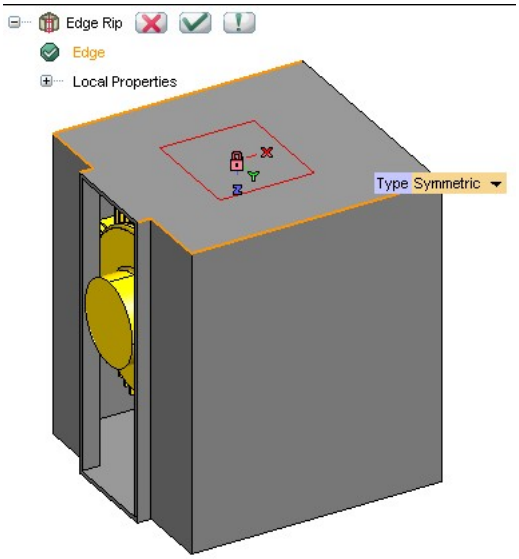



Click OK.

Let's now **Edge Rip** the solid and **Unbend** it keeping the highlighted face fixed as shown below . The edges that we **Edge Rip** should be selected based on this criteria.



- Start the **Edge Rip** command.
- Select the Edges to Rip as shown.

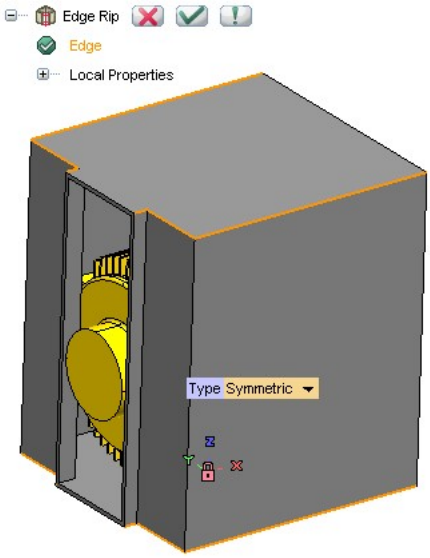



Click OK.

Similarly, select the edges on the opposite face also.

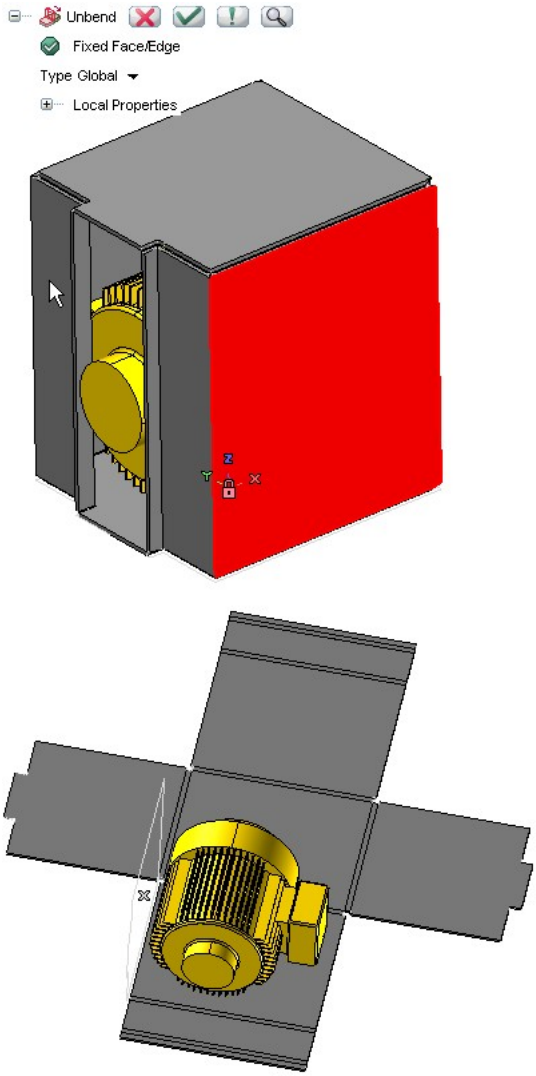
Let's now **Unbend** it and see how the development looks like.

- Start the **Unbend** command.
- Select the Bottom highlighted face as the Fixed Face.




Click OK.

The Unbent Solid looks as shown..

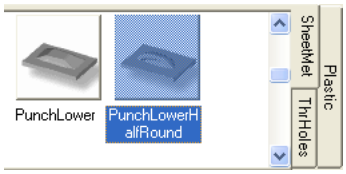



Let's now **Rebend** this Solid.

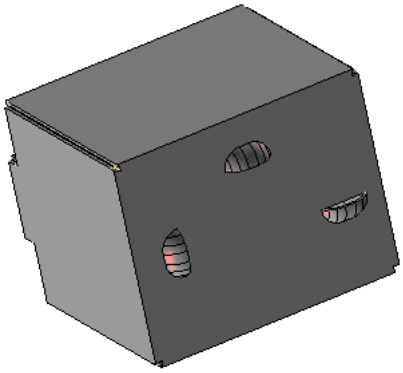
The Solid gets Rebent back to its original shape.

Let's now add a Smart Object and see how an **Unbend** operation affects it.

- Click on the **Smart Object Library** to bring up the Library.
- Click on the Sheet Metal tab.
- Right Click on Item Punch Lower Half Round in the Library and say Insert.



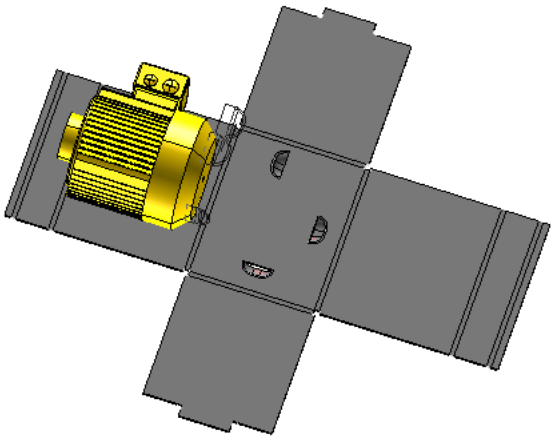

- Select the Bottom face of the Solid as Face.
- Place 3 instances of the Smart object.



Click OK.

Let's now **Unbend** this Solid and see what happens to the Smart Objects.

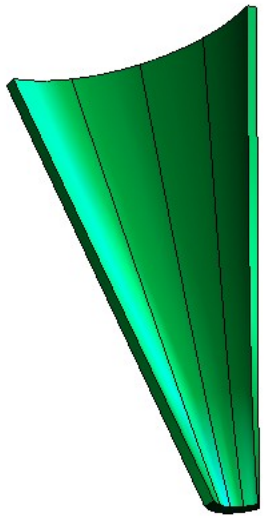
The Solid gets Unbent but not the Smart Objects.They remain placed as the are.



# 4. Step 4: One typical example

In this Step, We shall look at a typical example where Sheet Metal functionalities can be really useful.

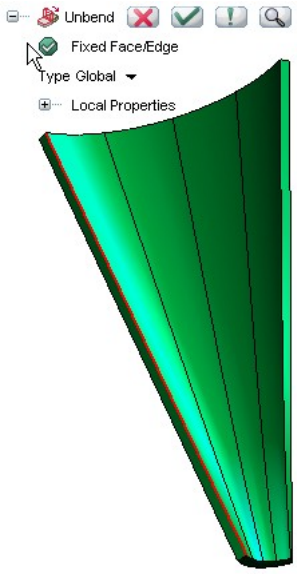
**Open** conic.e3 .



You can see that this solid has Profiles that are twisted along the height of the model.

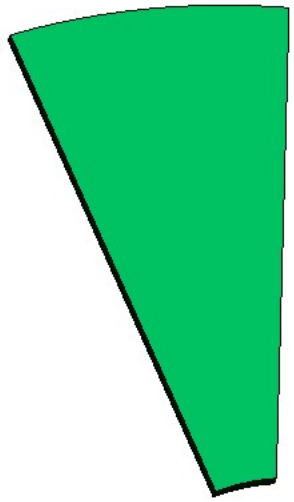
We will now **Unbend** it and see how ThinkDesign manages such a condition.

- Start the **Unbend** Command .
- Select one of the Vertical edges as Fixed Edge.
- Set Type Global.




Click OK.

The Solid gets Unbent as shown.



You are through with this task of Advanced Sheet Metal features.