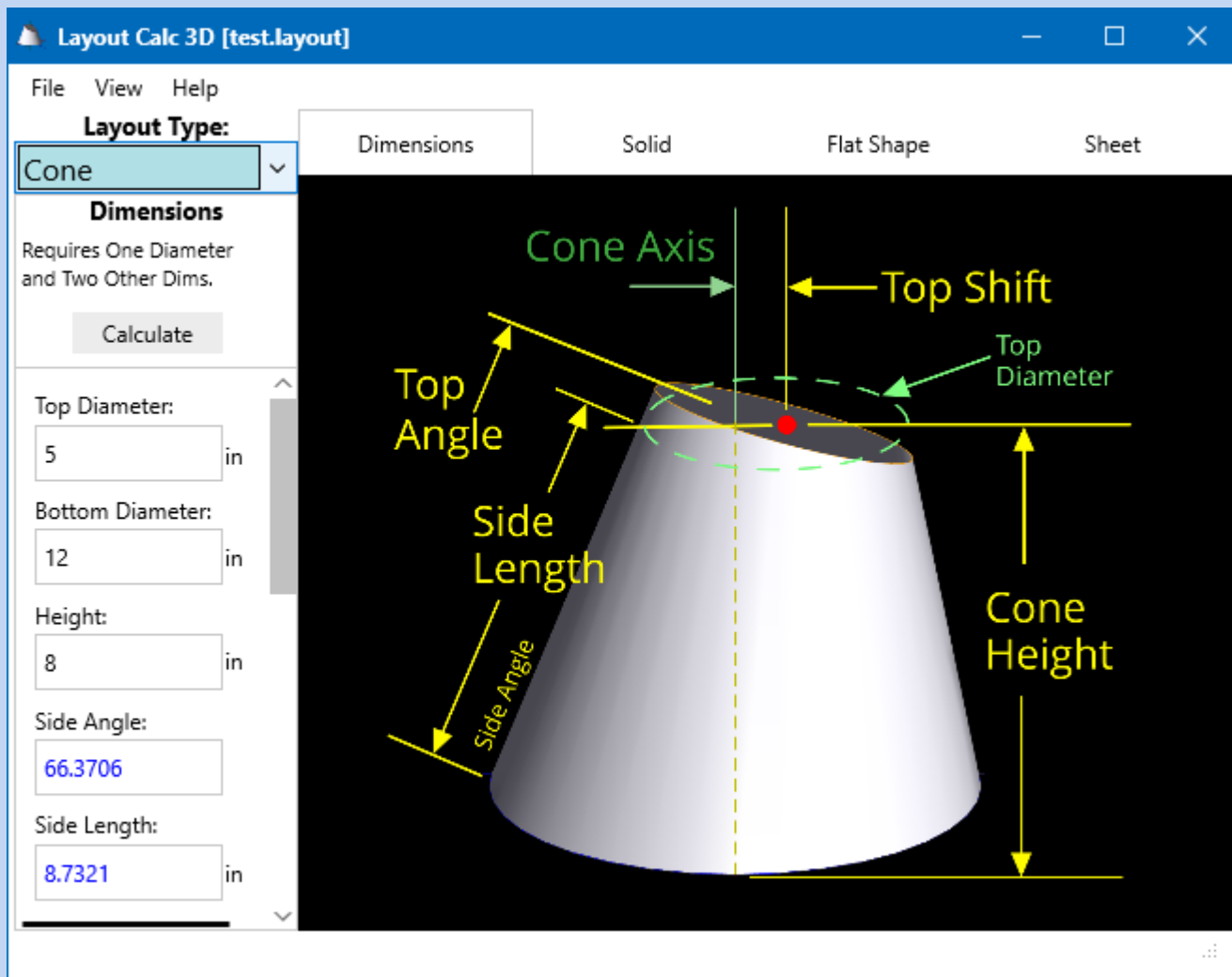
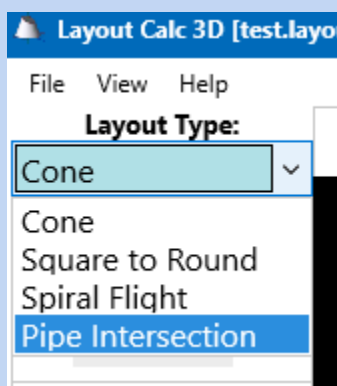


# Cone Calc 3D Help

Cone Calc is a program to calculate the flat sheet metal pattern needed to construct several different fabrications of certain dimensions.



**Choose the Layout Type** On the left side dropdown box choose from Cone, Square to Round, Spiral Flight layout or Pipe Intersection.



**Regular Cones and Modified Cones** Regular cones are your normal everyday cones with concentric top and bottom diameters with height and angle. A modified cone can have the top

diameter shifted or angled. A modified cone is an Oblique Cone or Oval Cone. But on both kinds you will fill in Regular cone data.

**Enter Cone Data** You only need one diameter and two other dimensions to define a cone. Enter the ones you have available.

### Filling the cone dimensions

On the Enter Data tab is a picture of an example finished cone shape. It is a cross section view. It has the possible dimensions labeled.

Enter the desired dimensions of the finished cone shape.

You only need to enter one diameter and two others of the five possible dimensions of the final cone. The other dimensions will be calculated from these.

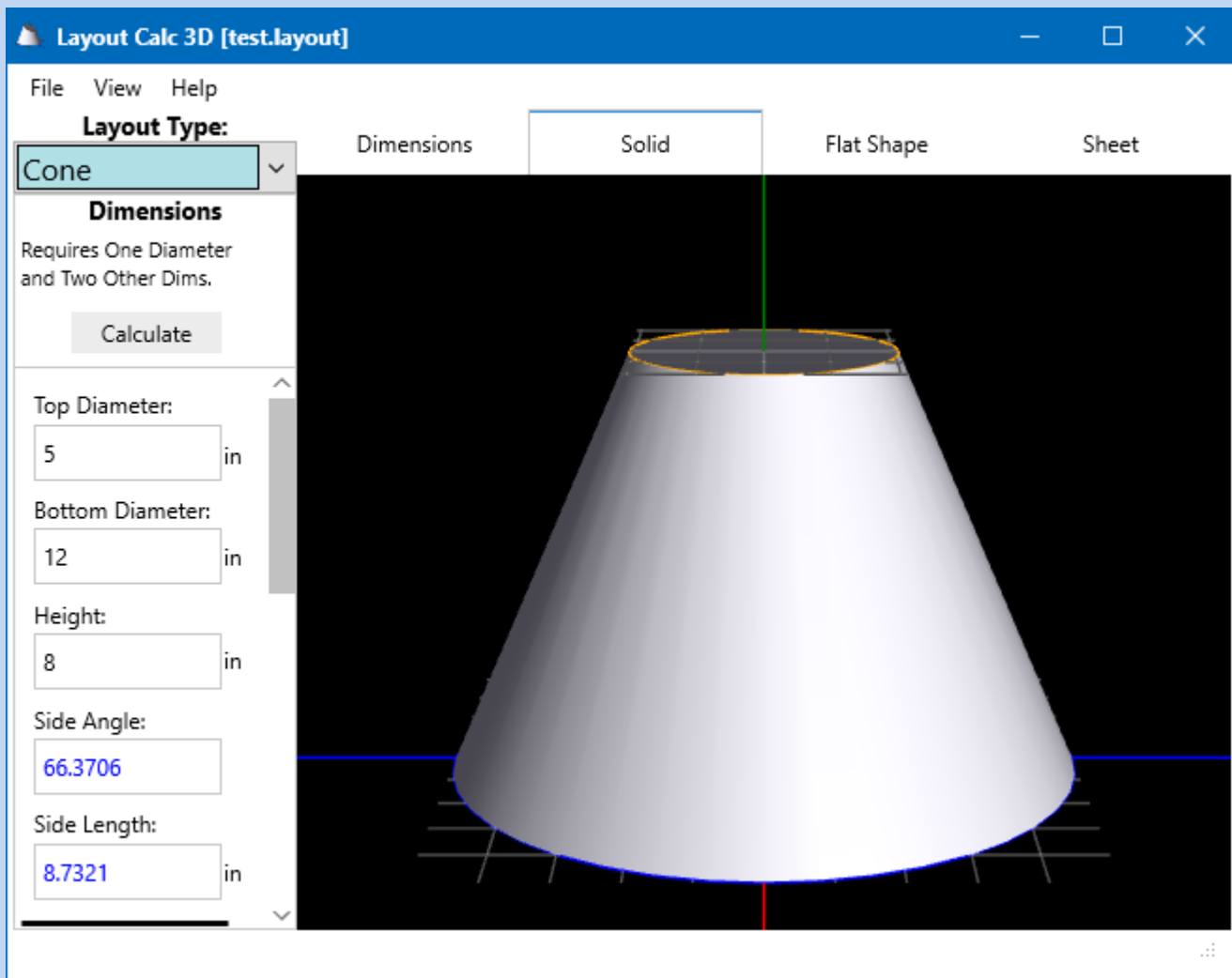
- The Bottom Diameter needs to be larger than the Top Diameter.
- Height is the height of the cone. If material has a thickness use the height from the inside corners or outside corners, but not both.
- Angle is optional in case you don't have one of the other dimensions.
- Length is the length along the angle of the cone.
- Overlap is optional. See below.

These dimensions are system agnostic, except when it comes to printing , so whether you enter the cone dimensions inches or millimeters, or anything else, the result will be in the same units..

To calculate the result, click "Calculate" on the Main Menu, or Calculate button, or press F2 function key.

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**Press F2 to Calculate** or Main Menu - Calculate. A 3D model of the calculated cone is displayed on the Cone tab. The Dimensions that you did not enter are filled in with blue color from the calculations. The model is interactive so you can change a dimension and press enter key and the model will change. You can hold down the left mouse button and drag the view of the cone around in the window



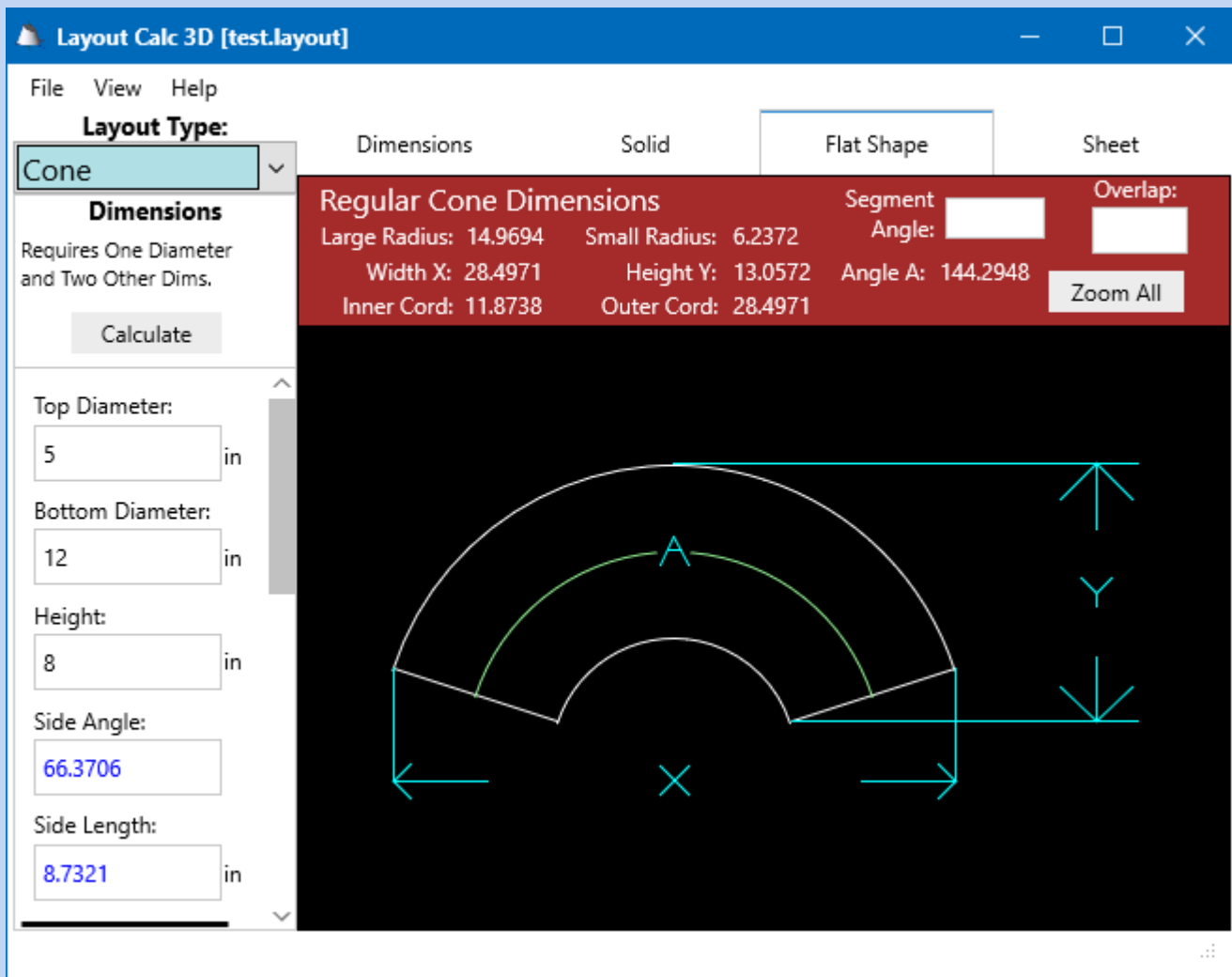
You will notice that in this example the last two items in the [Enter Cone Dimensions](#) box are blue. The blue items were calculated from the other data that was given for your reference.

After calculating, you can see the results on the [Result](#) and the [Sheet](#) tabs.

On the Result tab you will find the dimensions of the resulting flat pattern that you would manufacture and later bend around so the two straight edges meet. the result is a cone shape.

A drawing is made in the window of the flat pattern shape with the dimensions labeled.

**Flat Shape** - On the Flat Shape Tab is shown a drawing of the Flat Pattern and the dimensions that are needed to make the flat pattern. Drawing in window can be zoomed with mouse wheel and panned with center mouse button or ctrl-left-mouse button.

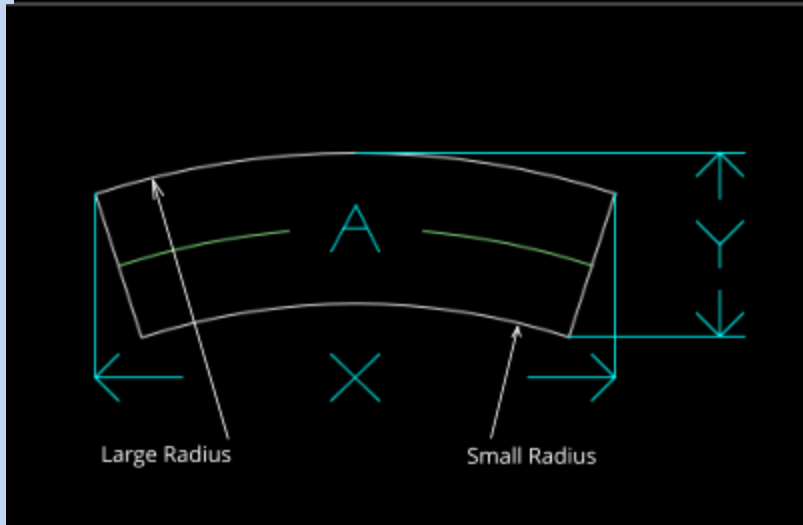
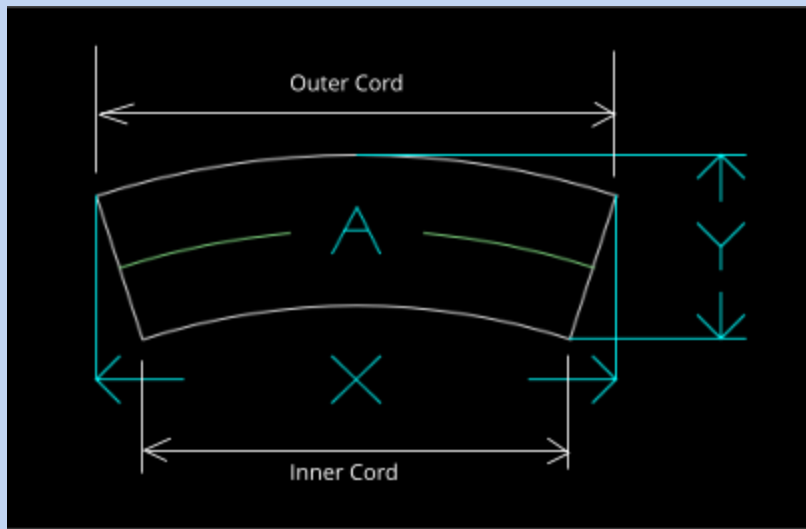


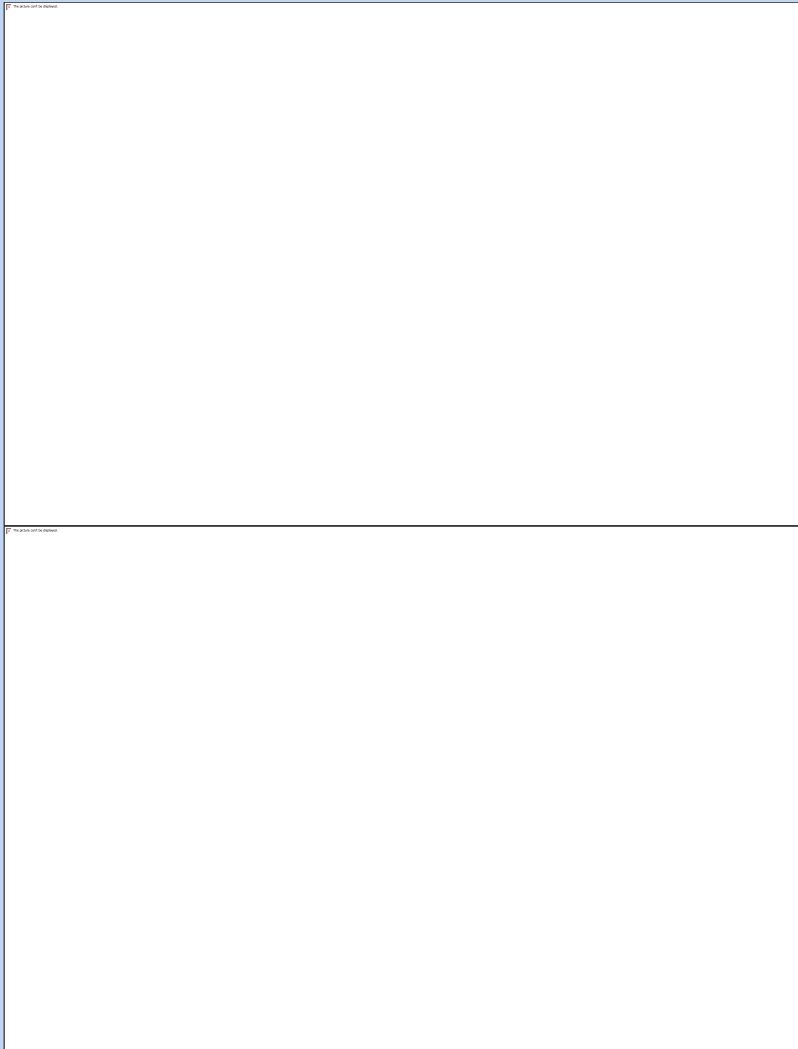
## Overlap

Normally, the flat pattern dimensions are exact and don't have any extra material for overlapping the edges. If you want extra material on the edges of the cone then add here. Half the extra material is added to both edges. If you enter 0.5 for overlap the shape of the original will be produced on the screen with the addition of red lines offset from each edge by 0.25. The dimensions shown will be to the red lines of the extra material.

**Segment Angle:** In case you need a partial section of a cone, you can enter an angle in the Segment Angle box. The angle is the angle on the finished cone. So an angle of 180 would make a half cone, an angle of 90 would make a quarter of the cone etc. This applies the new flat dimensions to the screen and the printed flat pattern. This only operates on regular cones.

## Cord and Radius





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## Modified Cones

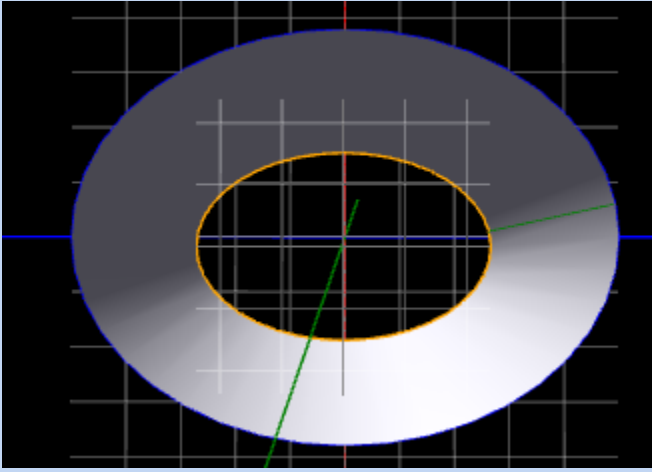
You can modify the cones in several ways:

- Shift the top. (shifting the top is the equivalent of shifting the bottom)
- Angle of Top hole. (can be plus or minus)
- Angle of Bottom hole
- Top Ellipse short axis. The long axis is the Top Diameter.
- Bottom Ellipse short axis. The long axis is the Top Diameter.

Sometimes you need a cone with an offset top hole or angled top or bottom. These cones are real cones but the flat pattern cannot be described by radial dimensions. In order to make these cones you would have to have a pattern that you could put on the material to draw the shape so you can cut it. That's where [Printing the Flat pattern](#) comes in below.

The Height dimension is always the height from the center of the bottom diameter to the center of the top diameter in the vertical direction.

**Elliptical Cones:** You can make a cone that has an ellipse on the top or bottom instead of a circle. These are the equivalent of a regular cone that has been squished into an oval or ellipse. The flat pattern has been compensated for the squished shape. When you assemble it, it will be a regular cone shape that you have to squish to your planned elliptical shape. This calculates a true ellipse from Diameter and Ellipse Short Axis. Diameter is the long axis.



**Cylinders:** You can make a cylinder when the Top Diameter and Bottom Diameter are the same value. The Top and Bottom Short Axis also have to be the same - otherwise it's actually a cone. Of course, the flat pattern for a cylinder is a rectangle. You can make a cylinder with a Top Angle or Bottom Angle, but not with Top Shift. A Top Shift can be duplicated with Top Angle and Bottom Angle.

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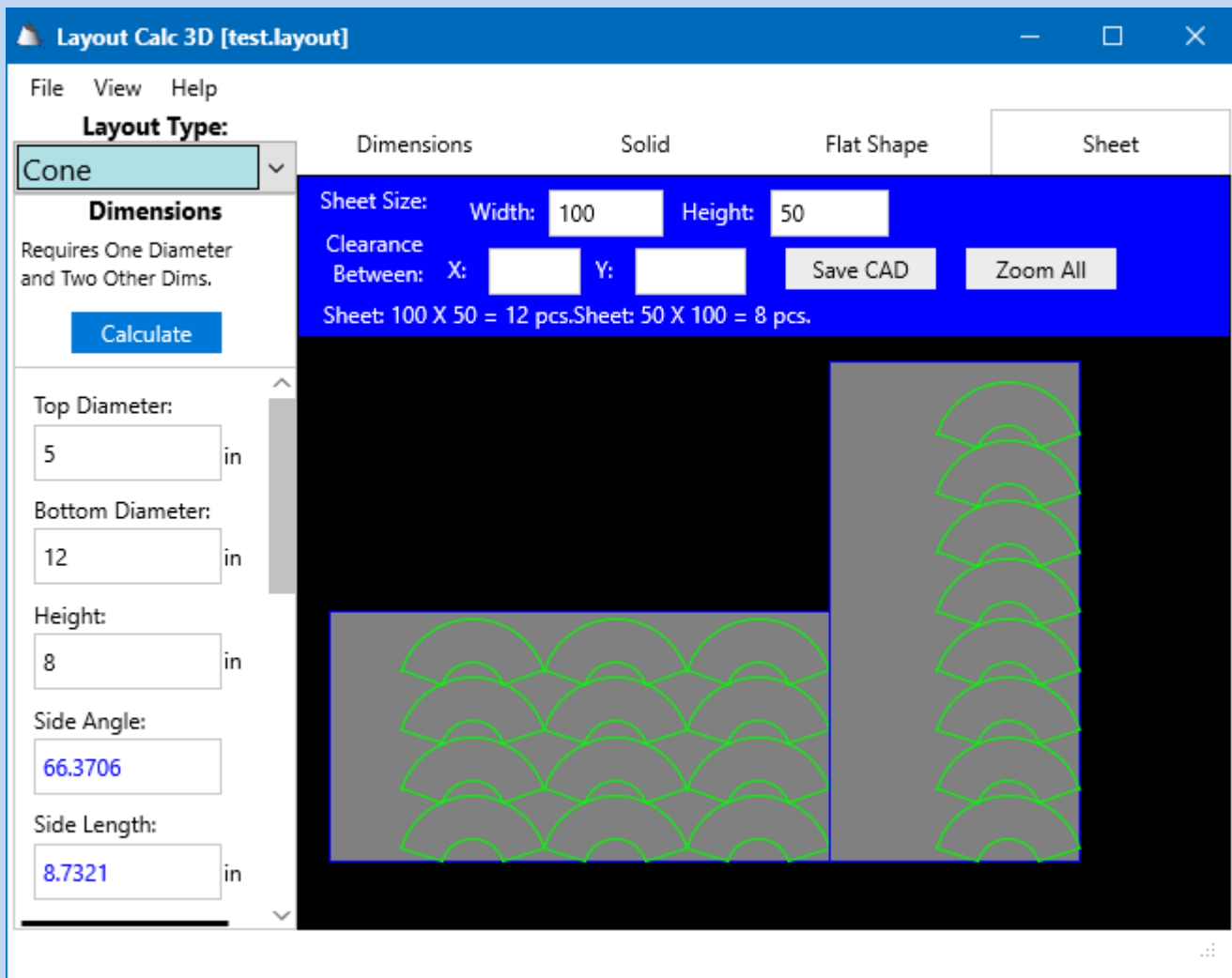
## Sheet

Optionally, you can enter the size of a sheet of material for calculating how many flat cone patterns will fit on it.

If you entered a sheet size, there will be a drawing representation on the [Sheet](#) tab.

You can zoom and pan the drawing. Zoom in and out with the mouse wheel. Control-Left-Mouse button, or Middle Mouse button will drag the picture around.

The Zoom All button will bring you back to window size.



Enter a value in "[Clearance Between](#)" if you want there to be a distance horizontal and for extra spacing between the patterns on the sheet.

This only applies to regular cones. With Modified cones the Sheet page is empty.

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## Saving and Loading

You can save the cone dimensions you entered in case you want to use them again later.  
Main Menu - File - Save Definition

You can load those settings again with Main Menu - File - Load Definition

When the program ends, the current settings are saved to a .cone file. If a file name has not been chosen, the name will be "untitled.cone".

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## Printing



You can print out a single sheet report that shows the cone dimensions entered, flat pattern results, and drawings of the single and full sheet flat patterns.

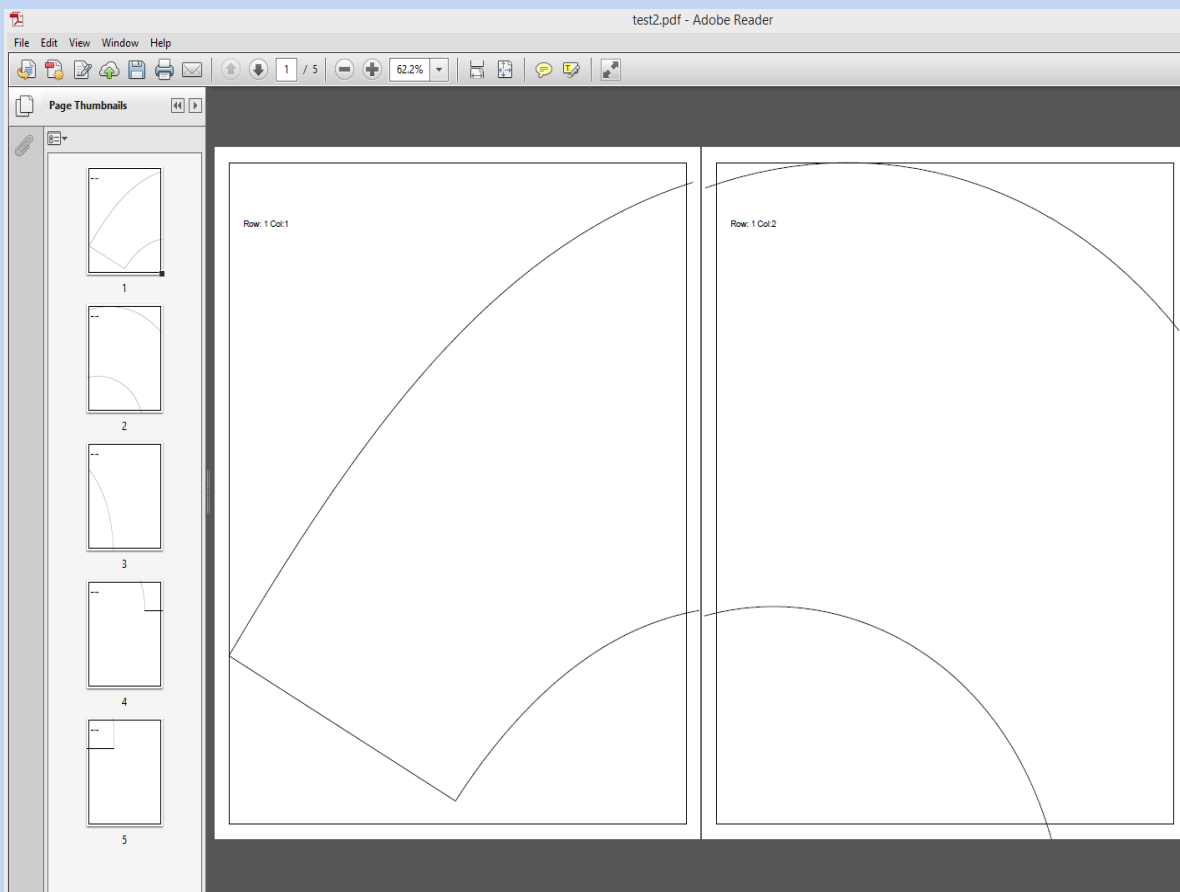
Main Menu - File - Print Data PDF

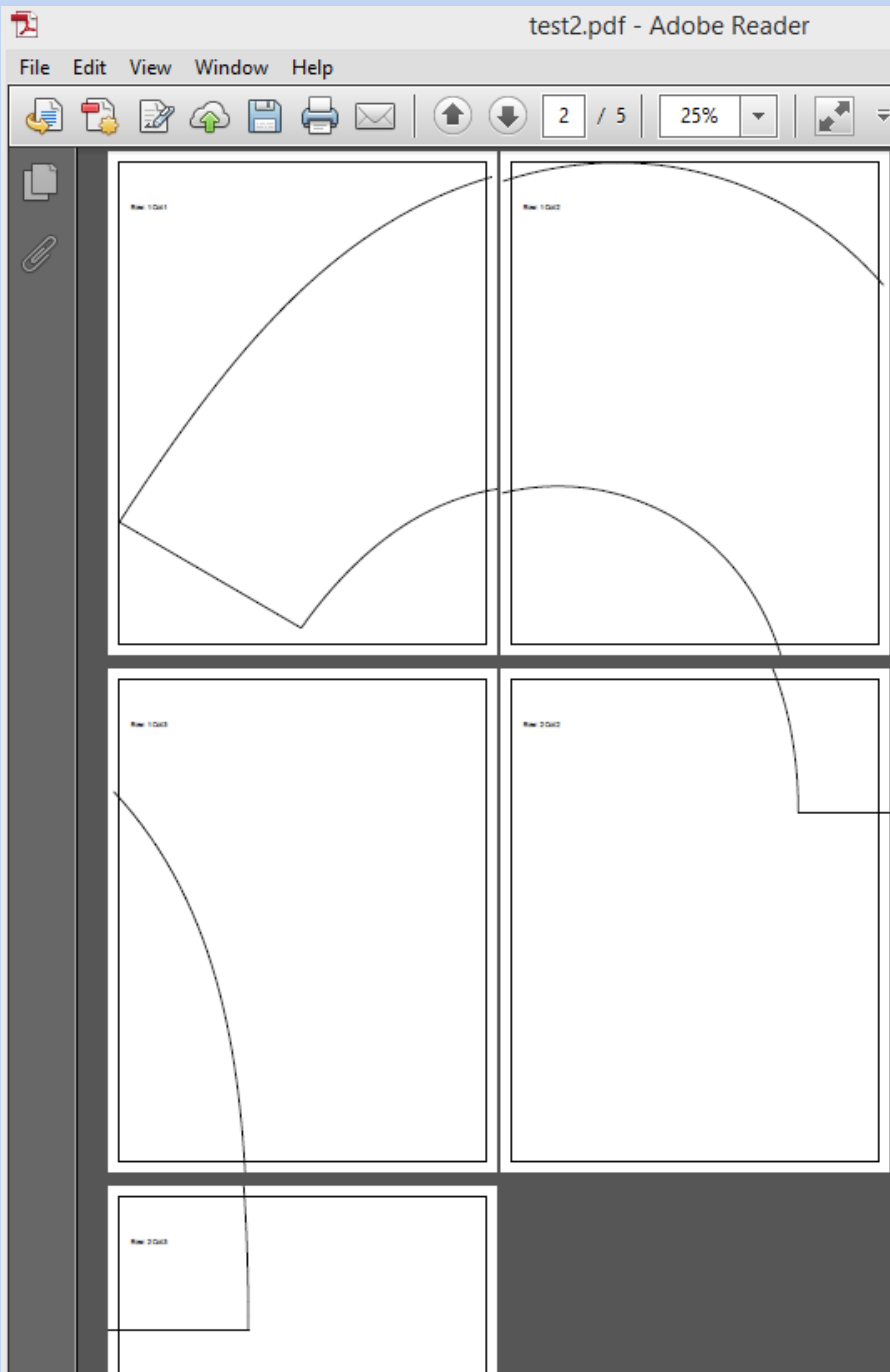
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## Printing Flat Pattern

Main Menu - File - Print Flat Pattern PDF

This creates a multiple page PDF file that has a full scale drawing of the flat pattern. This PDF can be printed on a printer on multiple letter size sheets of paper. The sheets can be cut out for use as a pattern for other material. Make sure you print the PDF file to the printer with the setting "Actual Size".





There is a printed border box around the edges of each page. Trimming these off will make the printed pattern section line up with the next page. Cut them out and tape them together to make one whole pattern. There is a limit of about 30 pages in size.

For OSX users, the PDF file may not display correctly in the built-in Mac previewer, may need to install Adobe Acrobat Reader.

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## Saving drawing to CAD file

It is possible to save the single shape and sheet flat patterns to a CAD file for importing into another CAD program.

Save the flat pattern of the cone from Main Menu - File - Save Flat Pattern CAD. Save the sheet CAD with the button on the Sheet page.

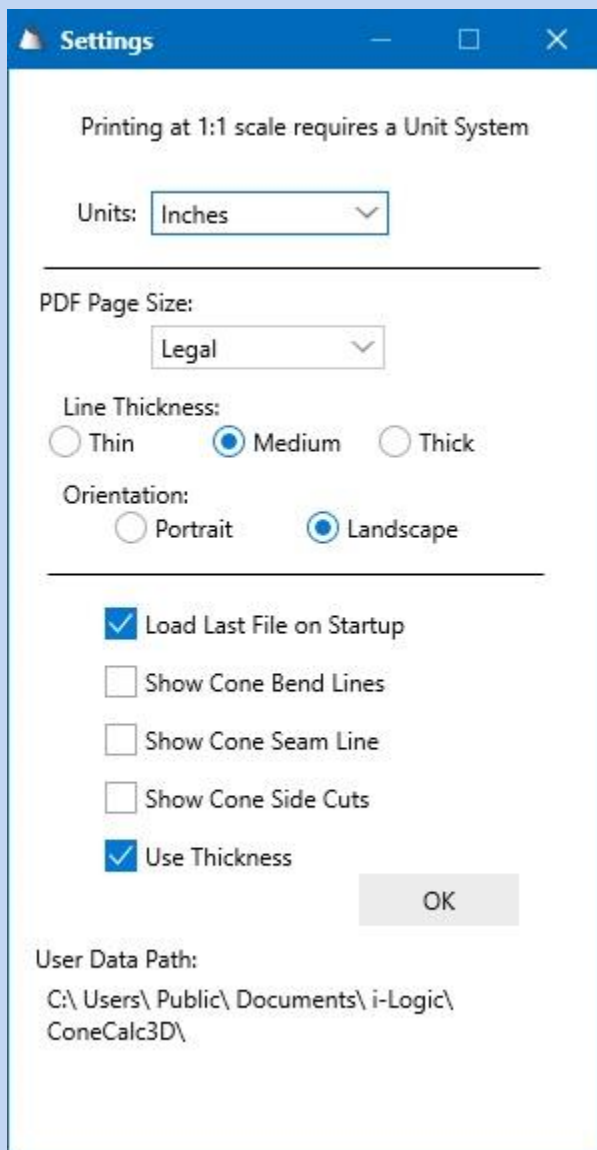
File can be saved as DXF, CDL or IGS format. In Windows you can choose the file type from the drop-down list. In OSX it will save it according to what file extension you give it. Output unit is Inches.

Main Menu - File - Save 3D CAD will save the wire-frame CAD of the 3D cone shape to a DXF, CDL or IGS file.

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## Settings

Main Menu - File - Settings will bring up Settings dialog.



The screenshot shows a 'Settings' dialog box with a blue title bar. The main content area is white and contains several settings sections separated by horizontal lines. The first section is titled 'Printing at 1:1 scale requires a Unit System' and has a 'Units:' label followed by a dropdown menu set to 'Inches'. The second section is titled 'PDF Page Size:' and has a dropdown menu set to 'Legal'. The third section is titled 'Line Thickness:' and has three radio button options: 'Thin', 'Medium' (which is selected), and 'Thick'. The fourth section is titled 'Orientation:' and has two radio button options: 'Portrait' and 'Landscape' (which is selected). The fifth section contains four checkboxes: 'Load Last File on Startup' (checked), 'Show Cone Bend Lines' (unchecked), 'Show Cone Seam Line' (unchecked), and 'Show Cone Side Cuts' (unchecked). Below these is another checked checkbox labeled 'Use Thickness'. An 'OK' button is located at the bottom right of the dialog. The final section is titled 'User Data Path:' and displays the path 'C:\ Users\ Public\ Documents\ i-Logic\ ConeCalc3D\'.

Settings

Printing at 1:1 scale requires a Unit System

Units: Inches

PDF Page Size: Legal

Line Thickness: ☐ Thin ☒ Medium ☐ Thick

Orientation: ☐ Portrait ☒ Landscape

☒ Load Last File on Startup

☐ Show Cone Bend Lines

☐ Show Cone Seam Line

☐ Show Cone Side Cuts

☒ Use Thickness

OK

User Data Path:  
C:\ Users\ Public\ Documents\ i-Logic\  
ConeCalc3D\

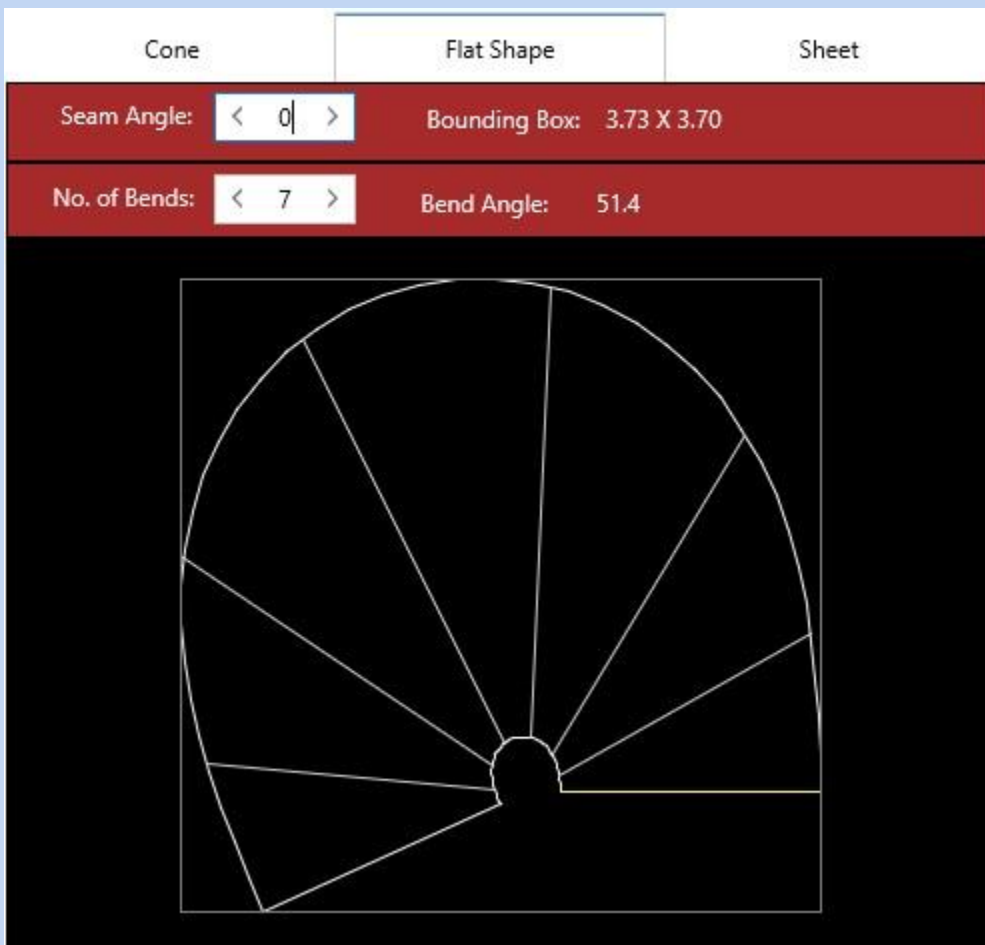
Normally it doesn't matter what units you are using as long as everything is the same. The only time the units is important is when printing on the printer at 1:1 scale. The Units setting will affect the printing of the Flat Pattern PDF.

If **Load Last File on Startup** is checked, the last cone file you were working on will be automatically loaded.

If **Show Bend Lines** is checked, the Bend Lines box will show up. Changing the value in the box (min of 4) will make lines on the flat pattern for that number of segments.

If **Show Seam Line** is checked, the Seam angle box will show up.

**Seam Angle:** When printing the flat pattern the seam is shown as starting at 0 degrees on the cone. If you wanted a pattern that started at a different angle you can put that angle into the Seam Angle box. This will draw a line on the pattern where that angle should be. After printing out the pattern you can manually cut the pattern along that line and then stick the other two ends together so that your pattern now starts and ends at the angle you want.



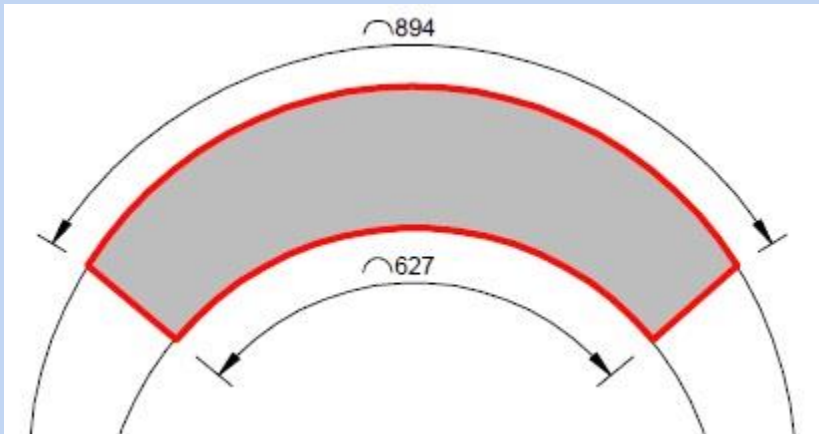
The **Bounding Box** size displayed on the Seam Angle bar will give the overall size of the modified flat pattern.

Seam Angle is not shown when the shape is a Cylinder.

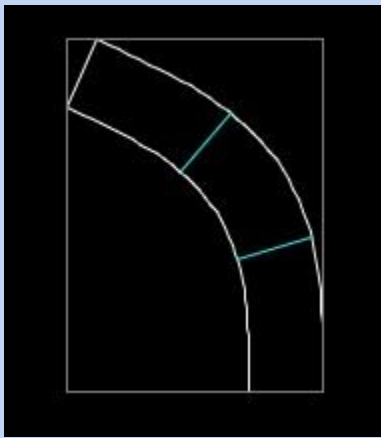
If **Show Side Cuts** is checked, the Side Cut box will show up. .

Top Cut Width:	<input type="text"/>	OR	Top Arc Length:	<input type="text" value="62.7"/>
Bottom Cut Width:	<input type="text"/>		Bottom Arc Length:	<input type="text" value="89.4"/>

You can cut the cone by a width or a arc length.



This draws lines on the flat pattern that represent these edges:



**PDF Page Size:** The PDF page size can be set here. If you have a printer that can print large poster size paper the PDF will be divided up into lesser number of pages. The page size is embedded into the PDF file so you need to set this the same as the paper size you are using.

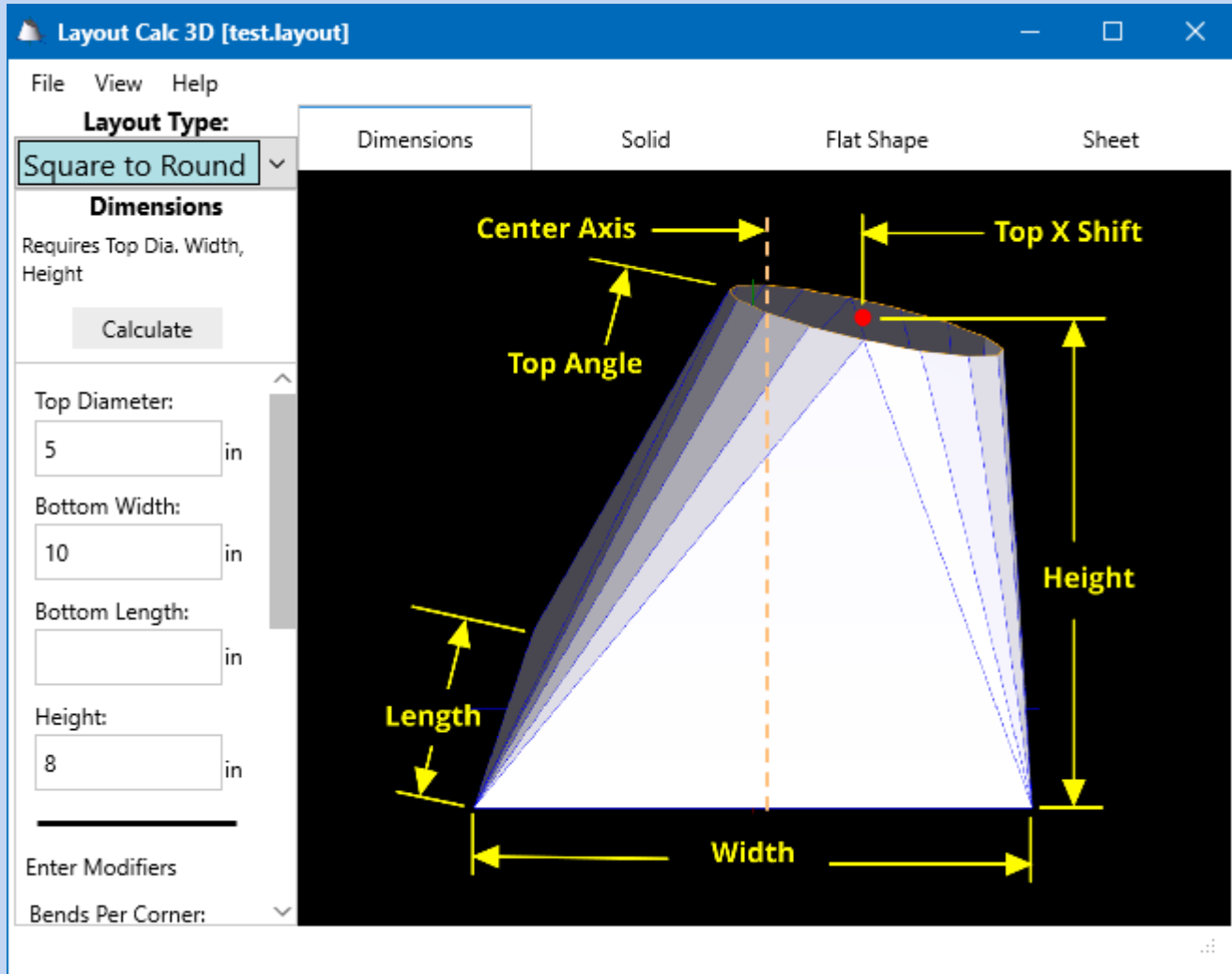
**Use Thickness:** If your material has a thickness, you can make it more accurate by choosing where the dimensions are taken from. Normally just say the top diameter and bottom diameter are from the middle of the material thickness. If your given dimensions are from the inside edge of the material you can choose that. It also calculates the weight of each piece made from steel.

Dimensions From:	Material Thickness:	<input type="text" value="0.25"/> in
<input type="radio"/> Outside <input checked="" type="radio"/> Middle <input type="radio"/> Inside	Area 612.6106 = 43.3881 lb each Steel	

The program settings are saved in a file, "ConeCalc3D.ini" in the user documents folder. For weight calculation a different material mass can be used by putting "MaterialMass=" in the ini file. (pounds per cubic inch)

# Square to Round

ConeCalc can also make flat patterns for Square to Round transition pieces.



Choose Square to Round in the Layout Type Dropdown box.

**Top Diameter:** This is the size of the hole on the top.

**Bottom Width:** The bottom width, left to right. (X direction)

**Bottom Length:** The bottom size, front to back. If this is blank then the bottom width will be used. (Y direction)

**Height:** Height from bottom to center of top diameter.

Modifiers:

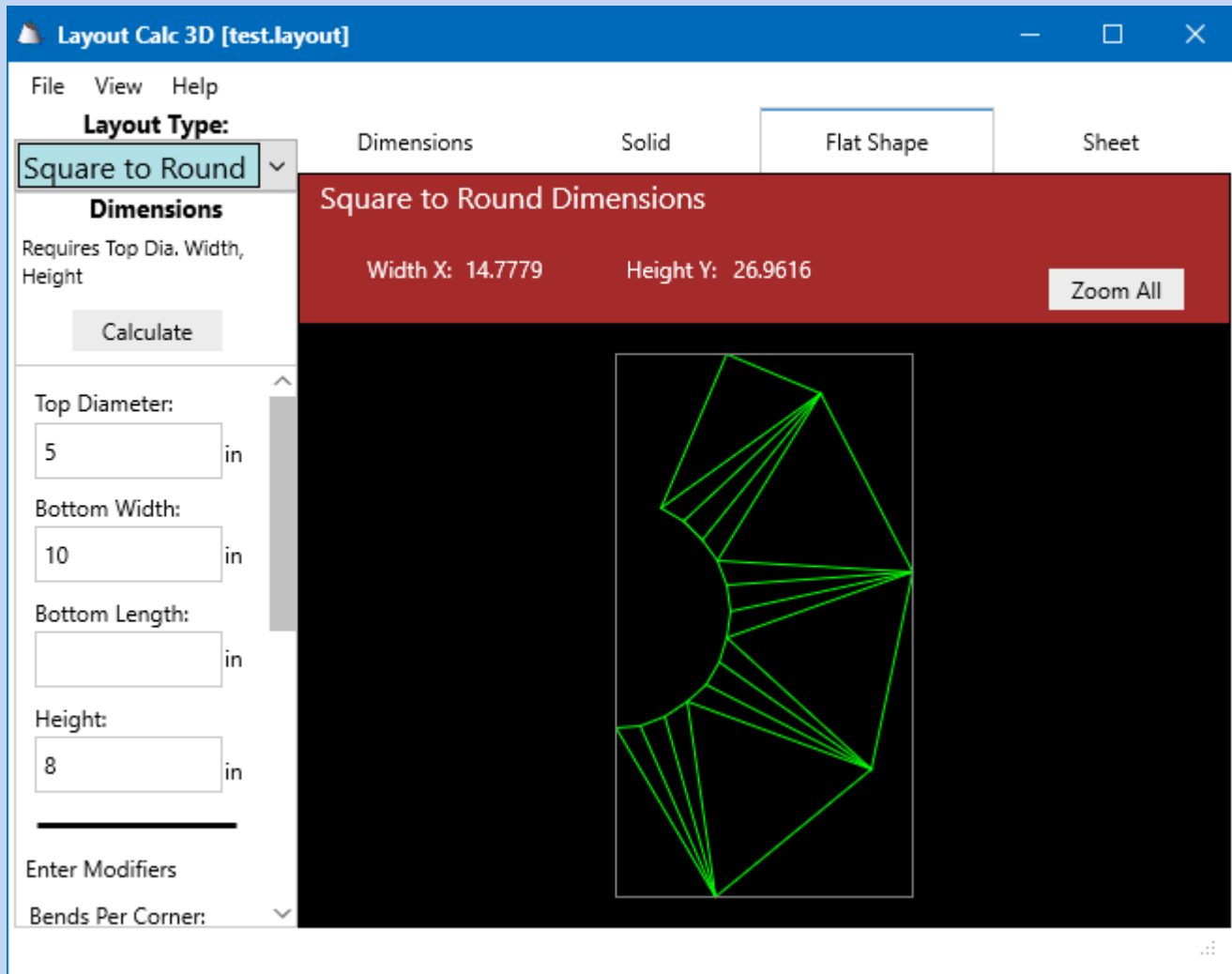
**Bends per corner:** Number of bend lines on each of the four corners. The top diameter has (Number of bend lines \* 4) steps. Must be between 4 and 10.

**Top X Shift:** Shifts the top diameter off the center in the X direction.

**Top Y shift:** Shifts the top diameter off the center in the Y direction.

**Top Angle:** Angles the top diameter direction on the Y axis.

**Half Pattern:** Check Box to create Half Pattern instead of Full Pattern.

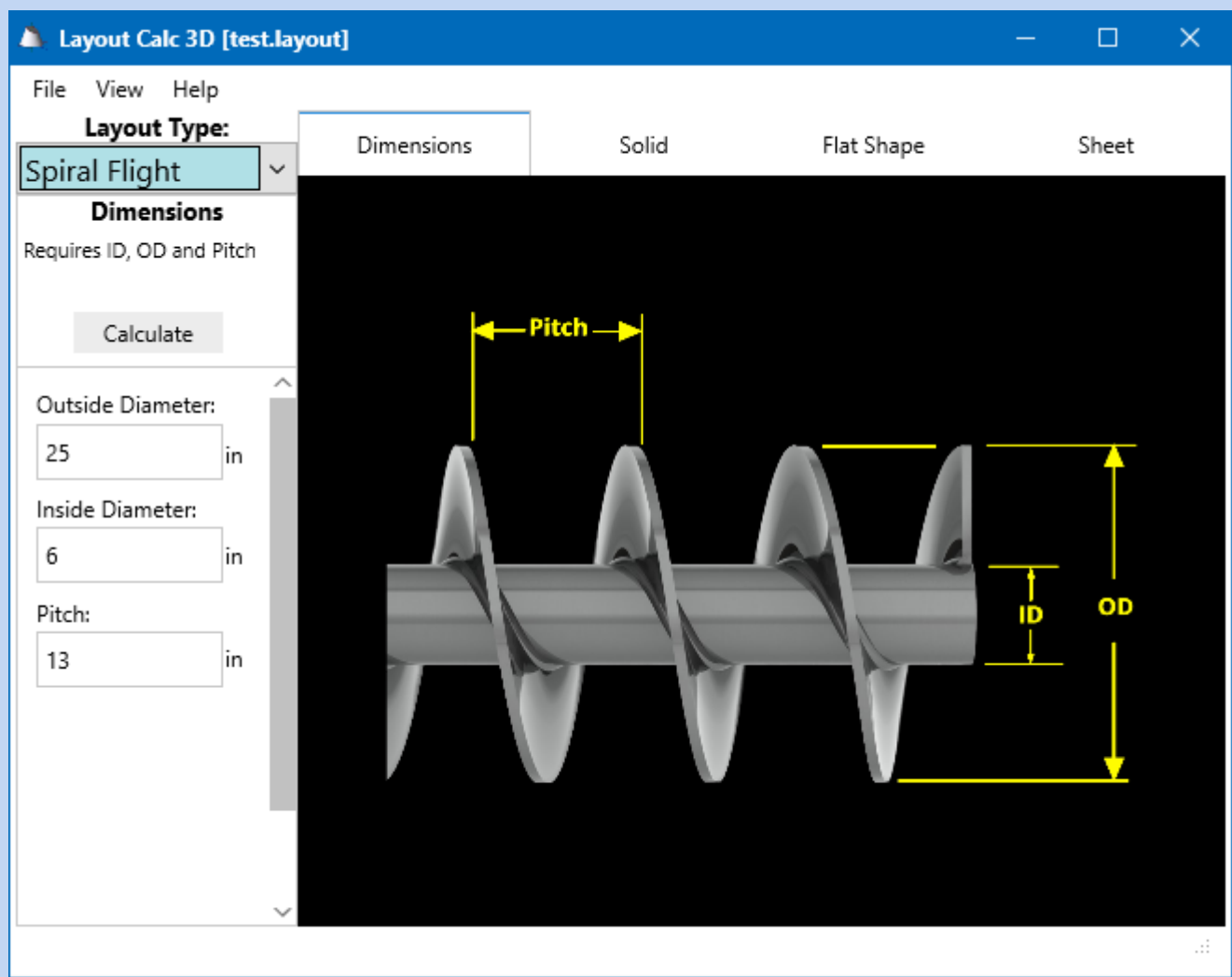


The created flat pattern has the split side at right side face of the 3D model. The pattern can be printed like above, or the CAD file can be saved.

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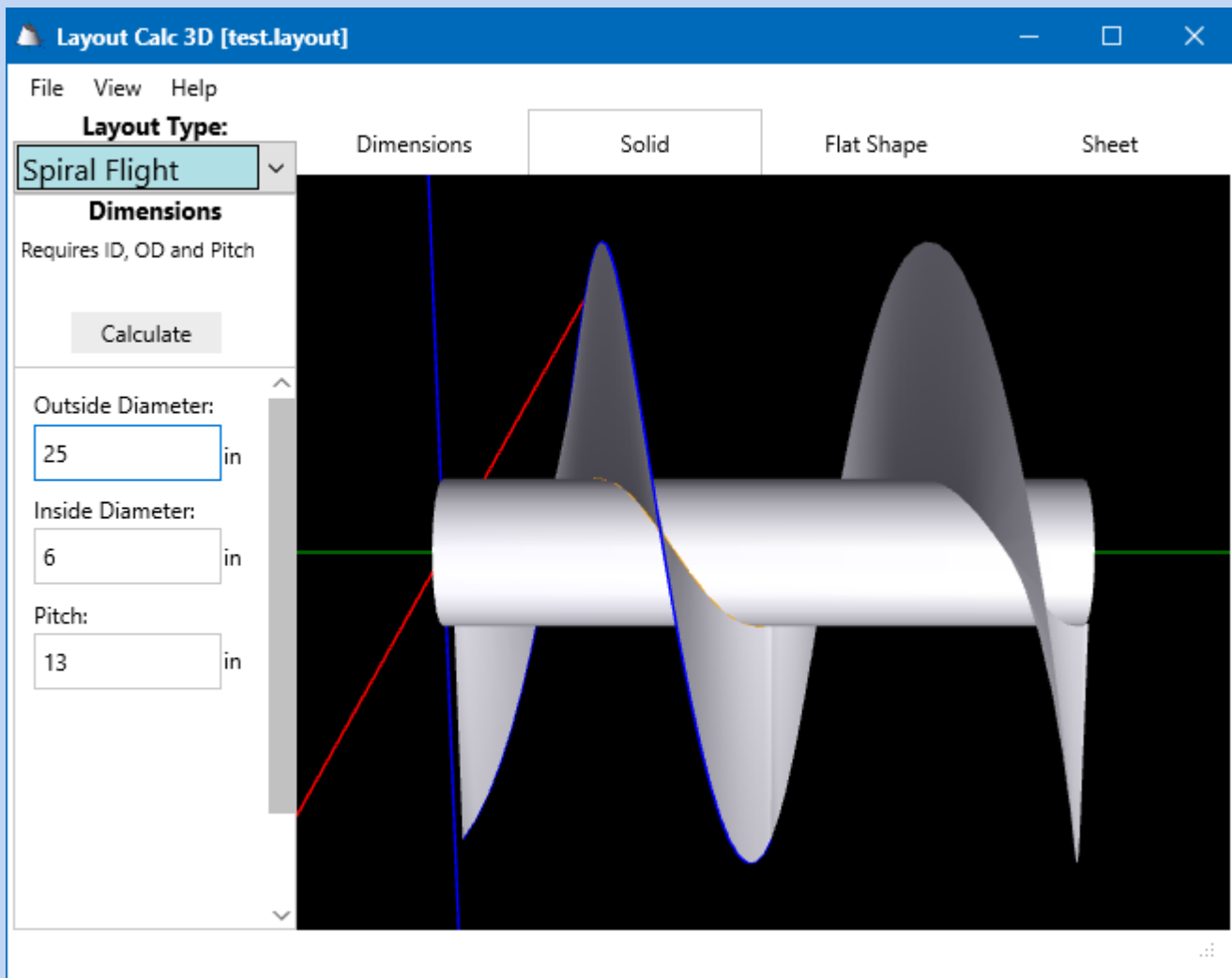
## Spiral Flight

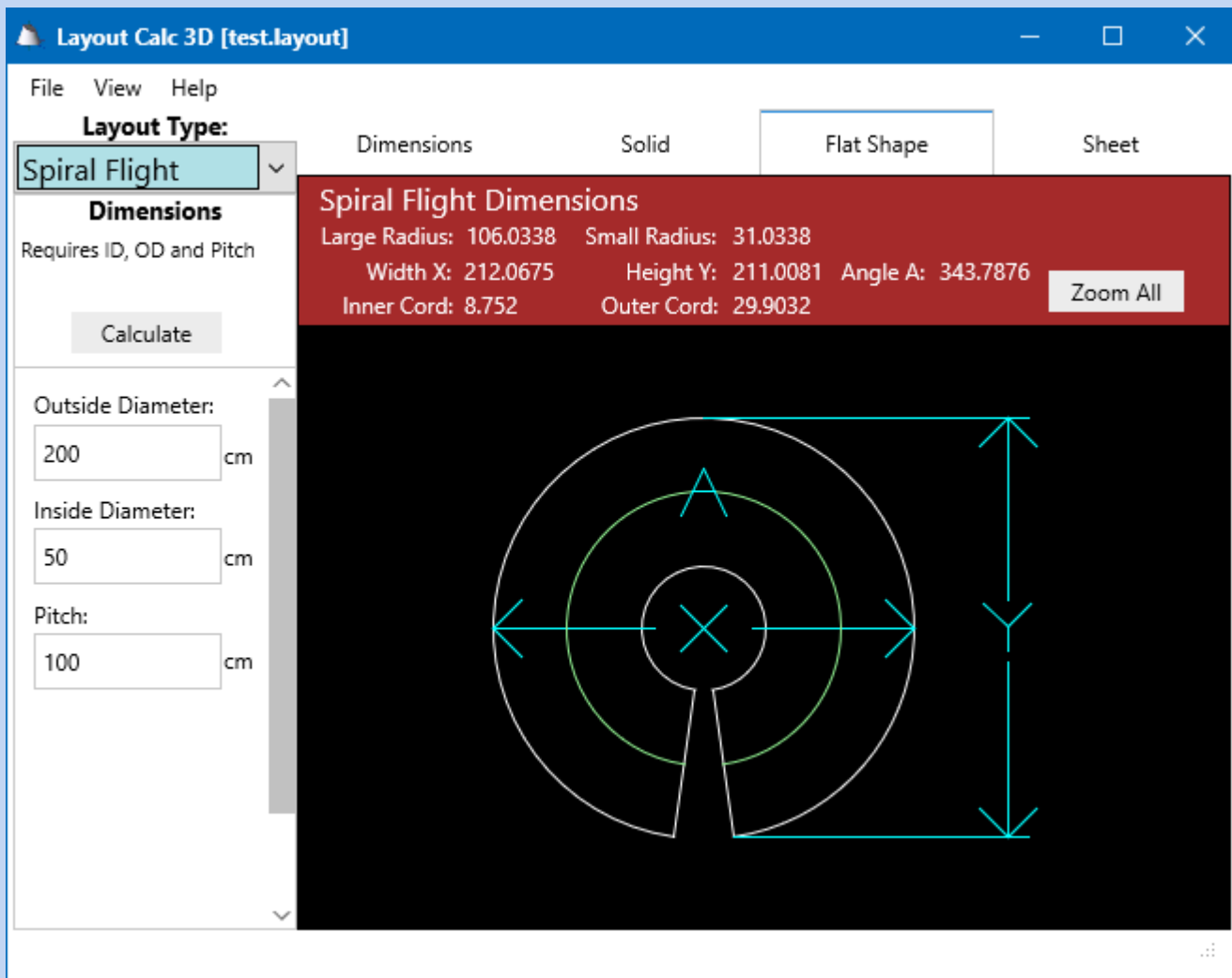
A Spiral Flight is for creating Screw Conveyors & Augers. The created flat pattern makes one blade section of the screw conveyor. You make many single sections and weld them around a central rod.



The 3D model shows two segments inline.

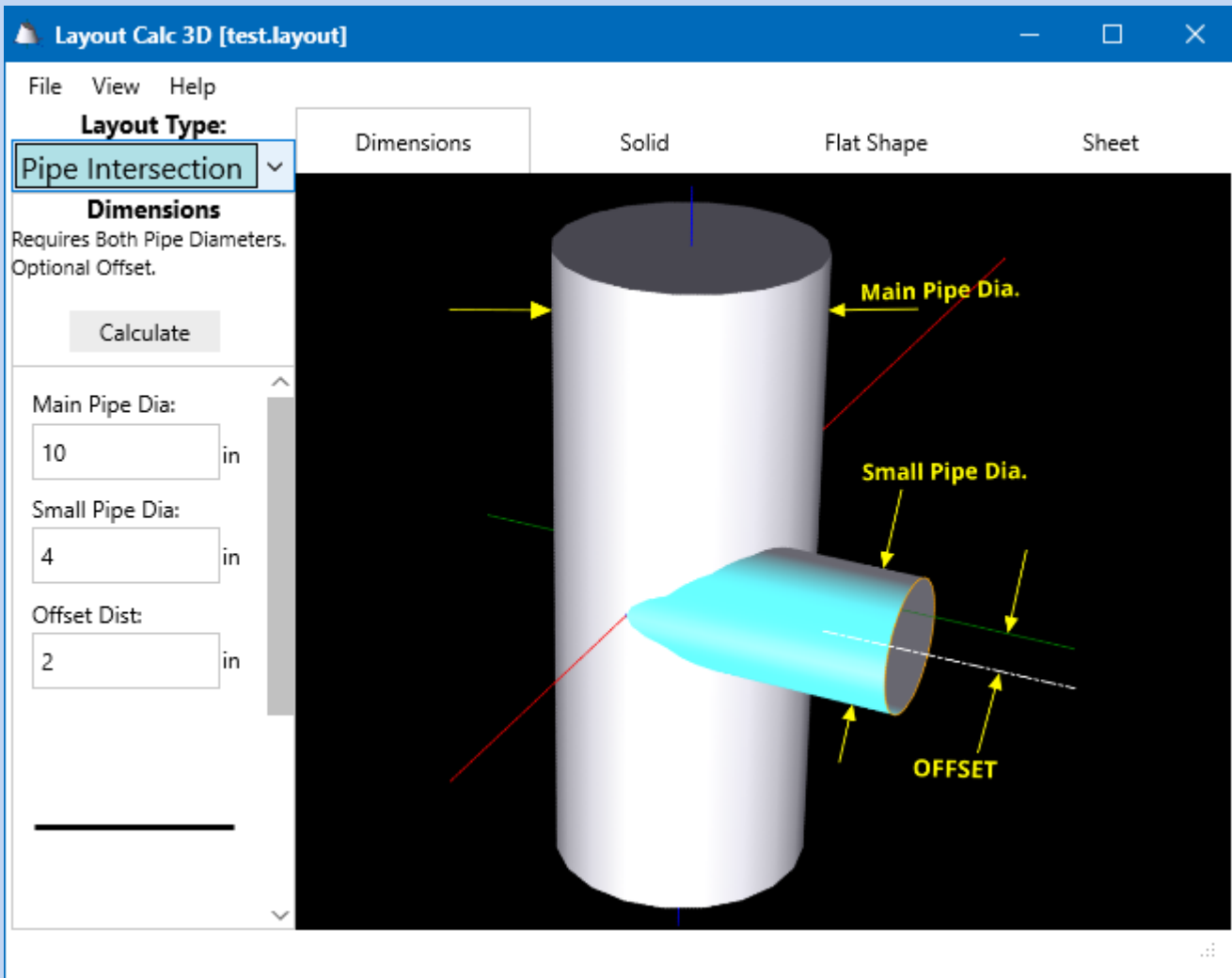




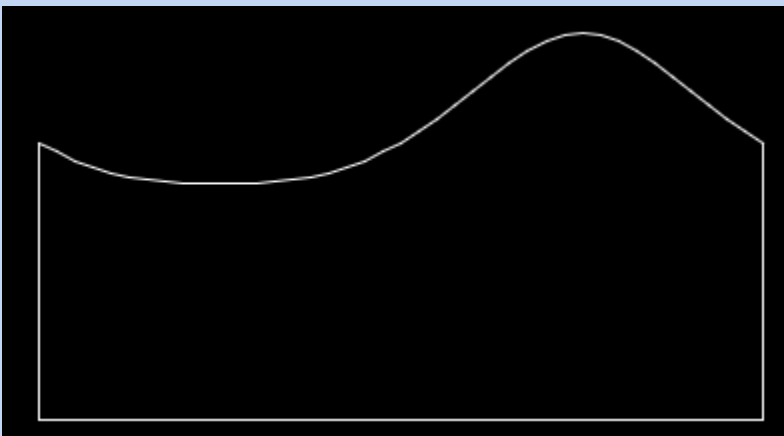


## Pipe Intersection

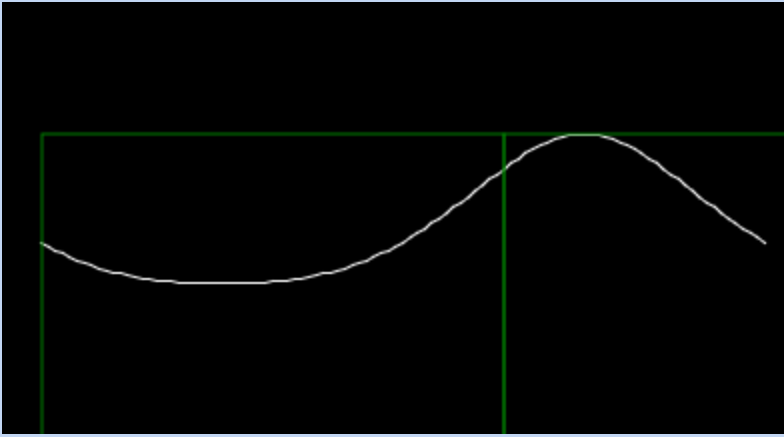
Make a pipe end that fits onto another cylinder.



The length of the pipe is arbitrary so a standard length is displayed.



The printed flat pattern only has the mating end contour. You can use the border lines to line it up with your material.



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## Activation

After installing the trial version application, permanently activate it by the instructions at <https://i-logic.com/ConeCalc3D/activation.htm>

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