

Making a Container with the 3D Printer and Plastic Pipe

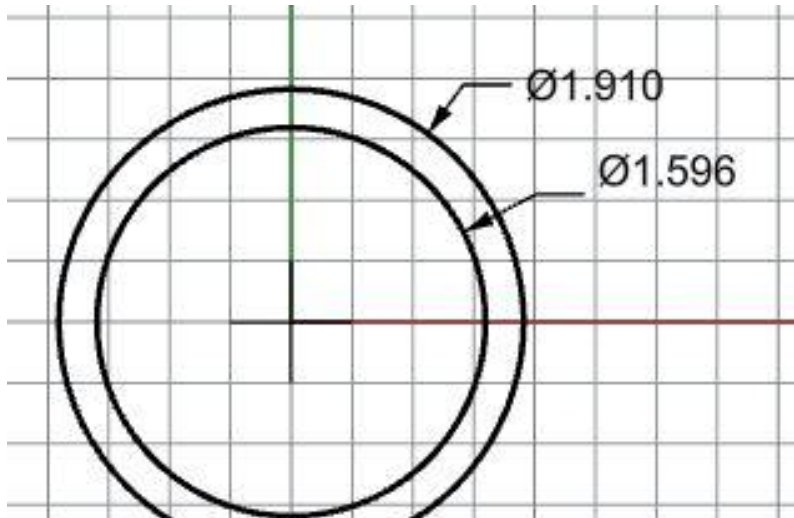


The Top

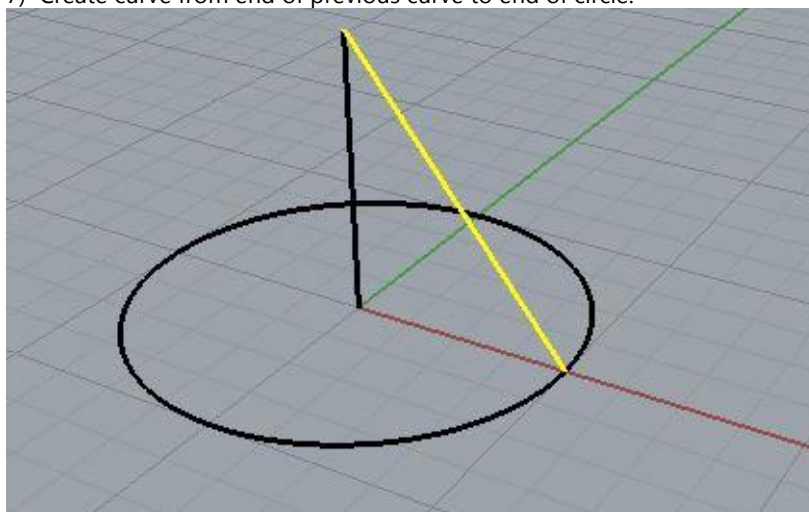


Display Mode = Artistic

- 1) Measure pipe and create top view Use Curves layer
 - a) OD = 1.910 b) Curve offset = .157 c) **Note: Center of Circle = 0**

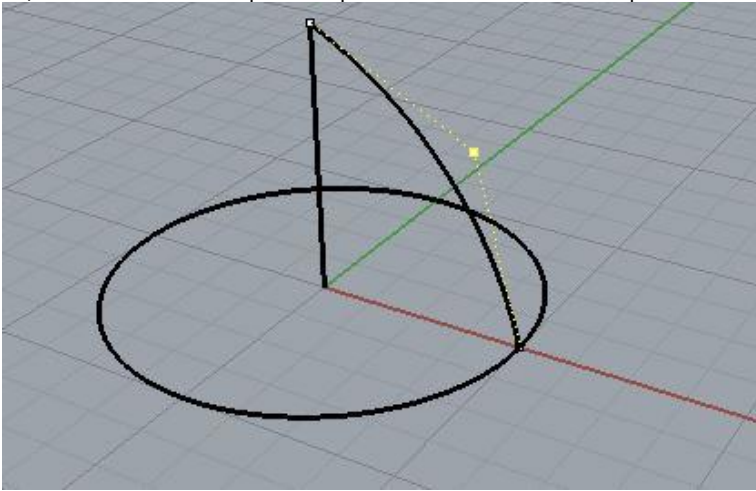


- 2) Rename Layer 01 "Tube". Make layer active
- 3) Extrude both circles. **Solid>Extrude Planer Curve>Straight.** Extrude distance = 1.875"
- 4) Rename Default layer Curves
- 5) Make Curves layer active, turn off Tube layer
- 6) Create a curve from center of Circle. Length 1.125
- 7) Create curve from end of previous curve to end of circle.

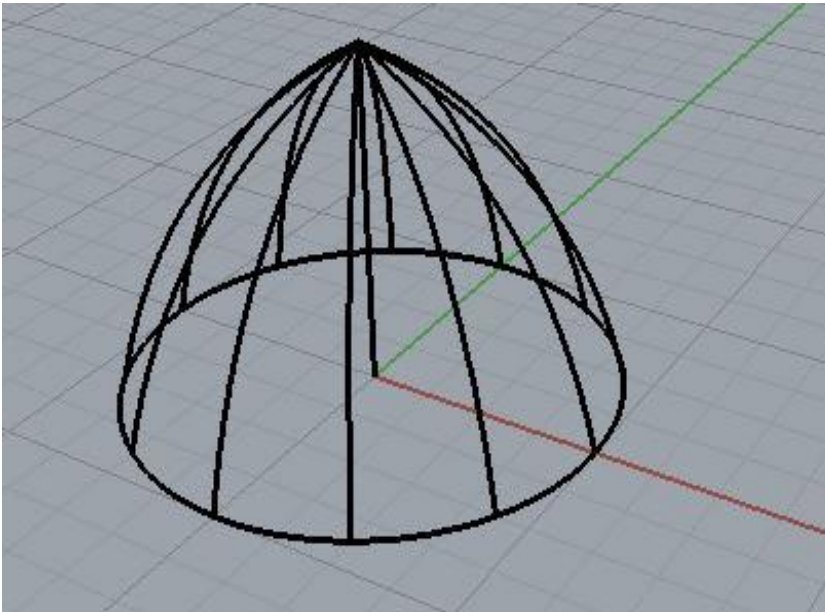


- 8) Use **Edit>Change Degree or type Change Degree** and change the angled line to **Degree 2.**
- 9) Use **"F10"** key to show control points.

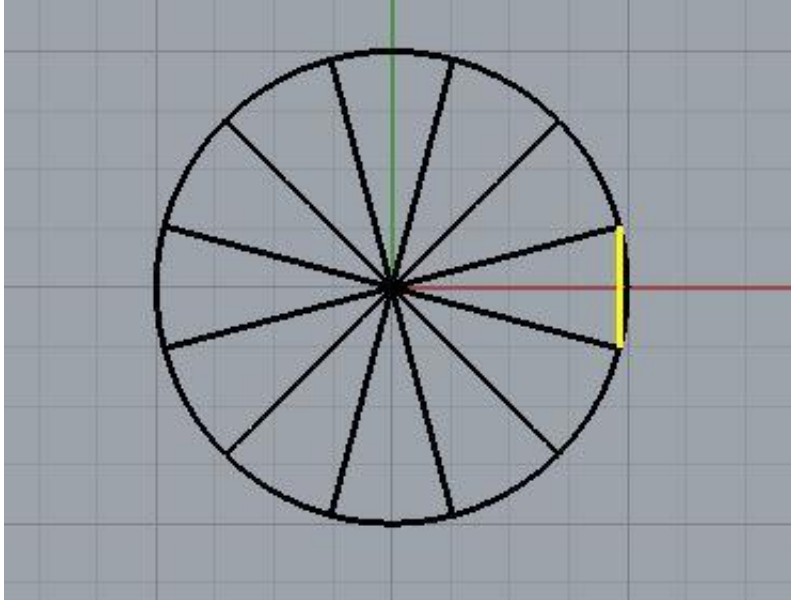
10) Use middle control point to pull line into a "curved" shape. Turn off control points using "F11"



11) Polar Array the curve around center of circle. 12 instances



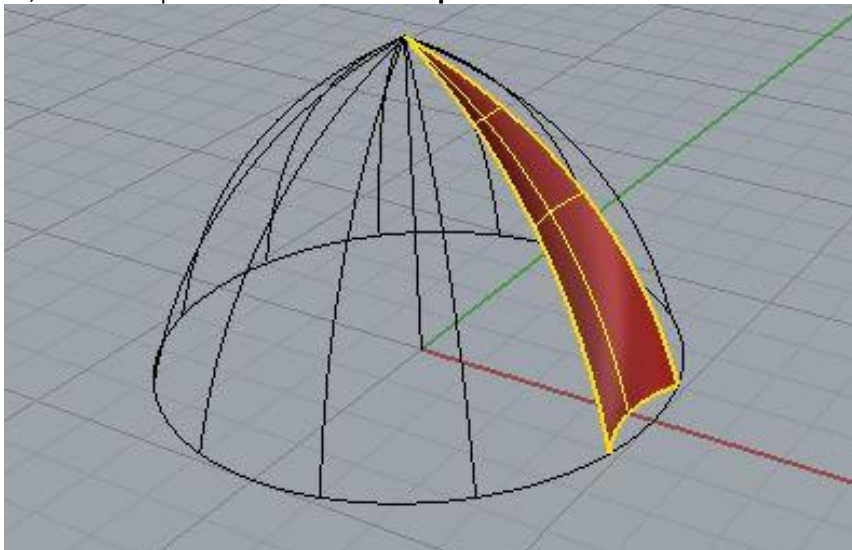
12) Rotate the 12 curves 15 degrees in TOP Viewport



13) Create a curve between two adjacent curves. Use "Endpoint" OSNAP

14) Modify curve with "Change Degree"

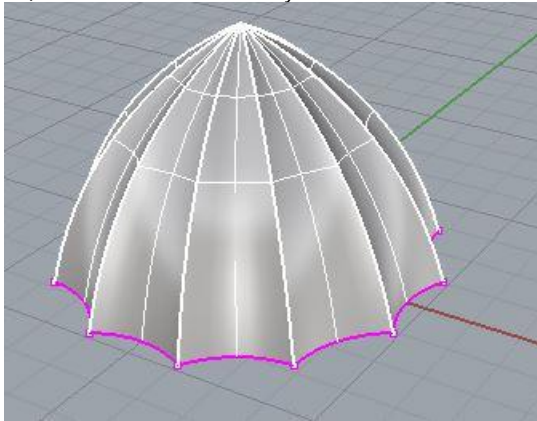
15) Use "Sweep 2 Rails" **Surface>Sweep 2 Rails** to make surface.



16) Make **Top** layer active and change surface into Top layer. Set Display to "Shaded" in Perspective V-Port.

17) Turn off Curves Layer and **Polar Array** the shaded surface.

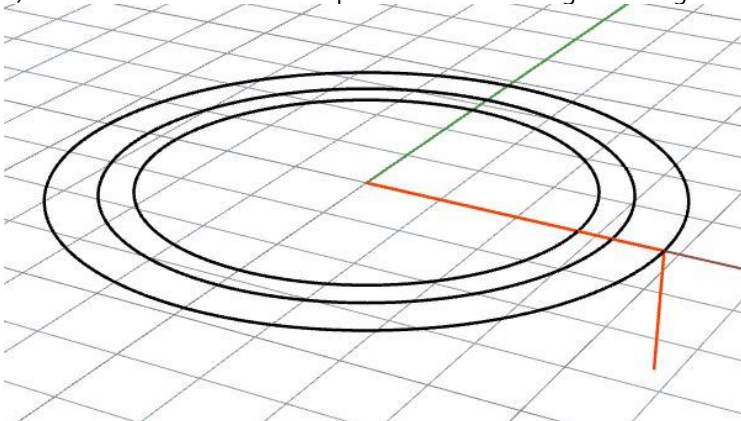
18) Join surfaces into a Polysurface. **Do Not "Window pick"** the surfaces when joining.



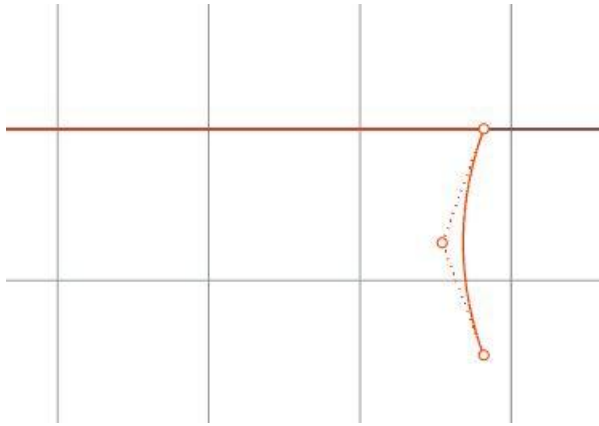
- 19) Analyze surface for naked edges **Analyze>Edge Tools>Show Edges**
- 20) Offset the Surface. **Distance= .040, Corner= Sharp, Solid=Yes, Tolerance=0.001, DeleteInput=Yes.**
Offset toward the center
- 21) Analyze for naked edges. **Analyze>Edge Tools> Show edges.**
- 22) Turn Curves layer on and Top layer off.
- 23) Offset the inner circle .062
- 24) Extrude the two outer circles -.062
- 25 Extrude the inner two circles .0625 with "both sides" choice set to yes
- 26) Union the two extrusions
- 27) Turn on Top layer and union with the extrusion **step 26. Pick the Dome 1st** and then the extrusion.
- 28) Analyze for Naked Edges and Non-Manifold edges.
- 29) Mesh from NURBS. Move mesh slider toward the far right.

Make the Base

- 1) Turn off Tube, Top and Dome Curves Layers.
- 2) Turn on Base Curves layer
- 3) Create curve from "0" to Quadrant of large circle at "Three o'clock"
- 4) Create a .375 curve from endpoint of last curve Angle 270 degrees



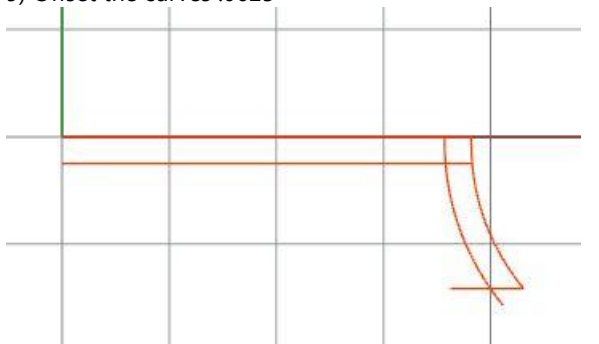
- 5) Turn off Pipe Curves layer
- 6) Change Degree of vertical curve to a degree 2 curve.



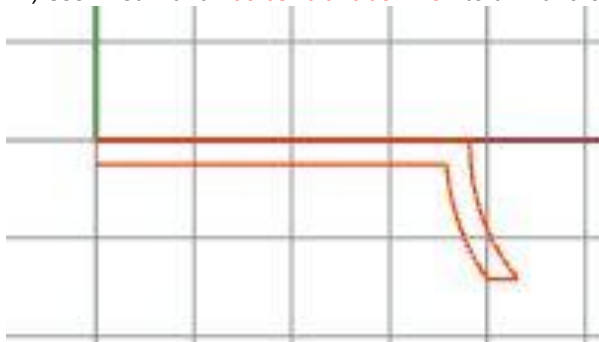
- 7) Use 'F10 and F11 to produce a curved line.
- 8) Rotate the small curve Clockwise



- 9) Offset the curves .0625



- 10) Create a curve from end of arc toward the left.
- 11) Use Fillet with a Radius=0 and Join=on to trim and connect the curves



- 12) Create a surface with Surface>Revolve. Use top V-port and a center of "0".
- 13) Turn on Pipe Curves layer and Extrude the inner diameter curve .062 inches

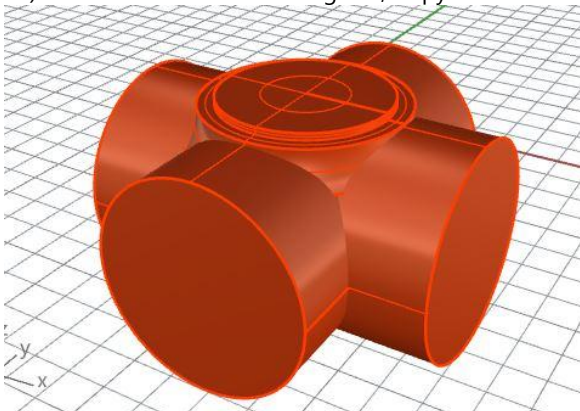


14) Create a 2" diameter circle at "0" in Front view and drag down so top quadrant is below the "floor" of base.

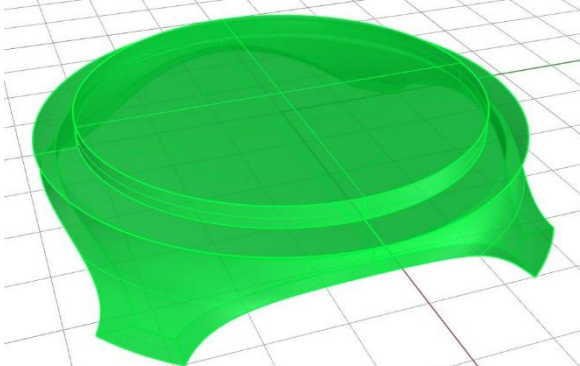
[Need drawing here](#)

15) Extrude the circle until it longer than the base is wide

16) Rotate the extrusion 90 degrees, Copy=Yes



17) Remove part of the base with Solid>Difference using the 2 extrusions as the cutting objects.



18) Turn off all but the Base layer and check for Naked Edges and non-manifold edges.

Mesh

1) Use Mesh>From NURBS Object. Set the Slider to far right

2) Use Export Selected to save the .stl for the printer