

# Simple Extrusion Tutorial – Cylinder and Tube

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## In this Tutorial you will:

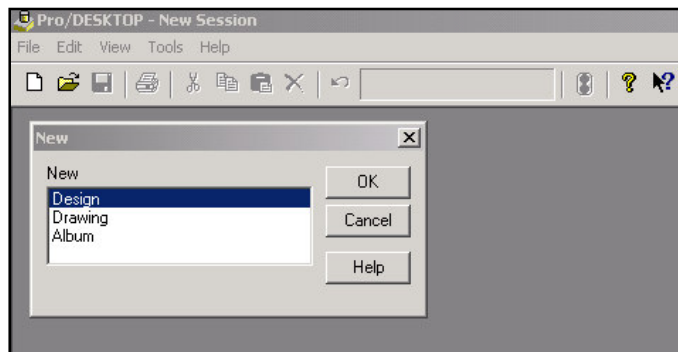
- Work in the Base Workplane.
- Use the Circle sketching tool, making concentric circles that form a valid “profile.”
- Use the one of the four major features of Pro/DESKTOP, Extrusion, to “push up” a 3D form from that profile.
- Save one file and use it again to create a second, different file.
- Access the Object Browser to modify a design.
- Assign objects colors.
- Import two files and create an assembly.

## 1. Open Pro/DESKTOP

- **Start > Programs > PTC Pro/DESKTOP 2000i2.**

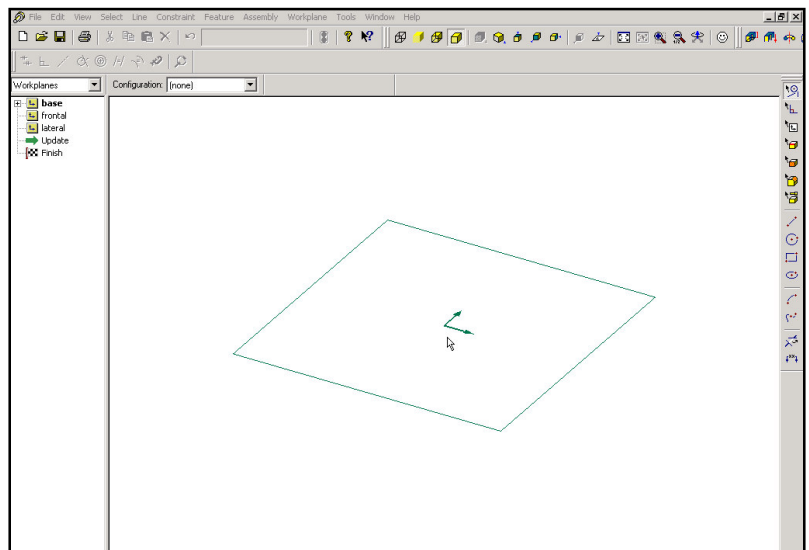
## 2. Open a new design in Pro/DESKTOP.

- **File > New > Design > OK** 



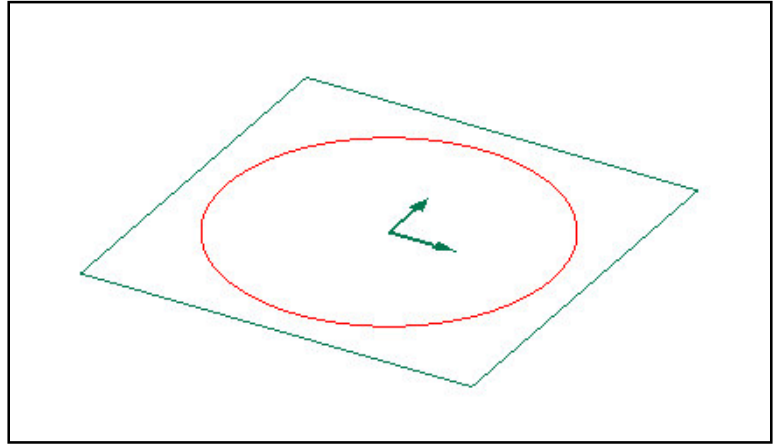
## 3. Select the Circle sketching tool . [C]

## 4. Move your cursor to the center of the design field.




**5. Draw a circle.**

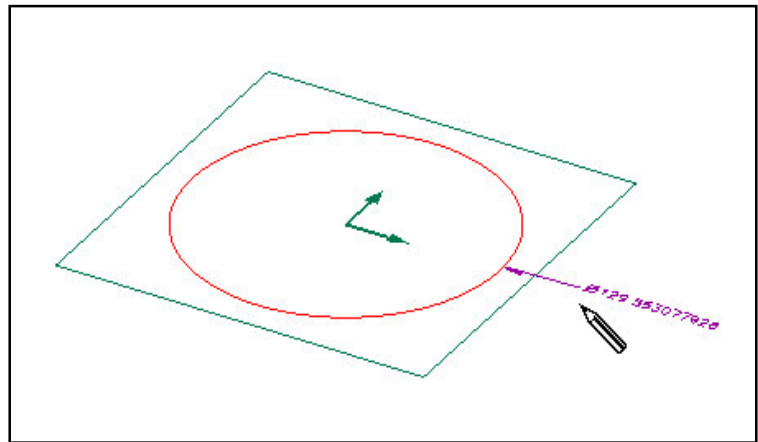
- Click and hold the left mouse button > drag a circle > release the left mouse button.



**6. Determine the diameter of the circle.**

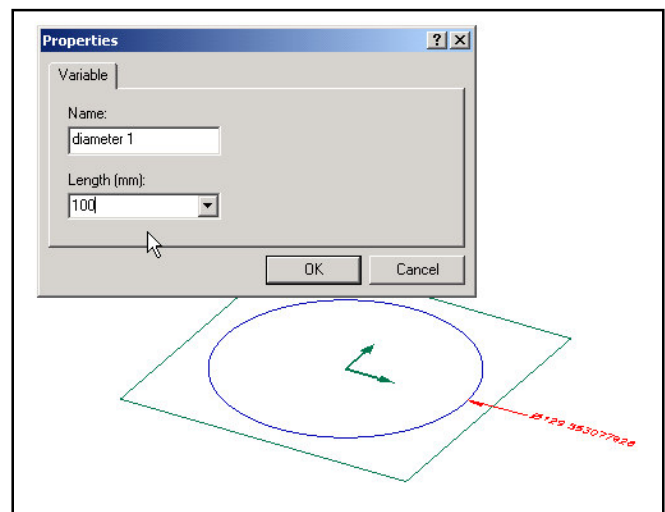
- Select the Sketch Dimensions tool . [Z]

- Move your cursor over to line that makes up the circle. Hold down the left mouse button and drag a short line.

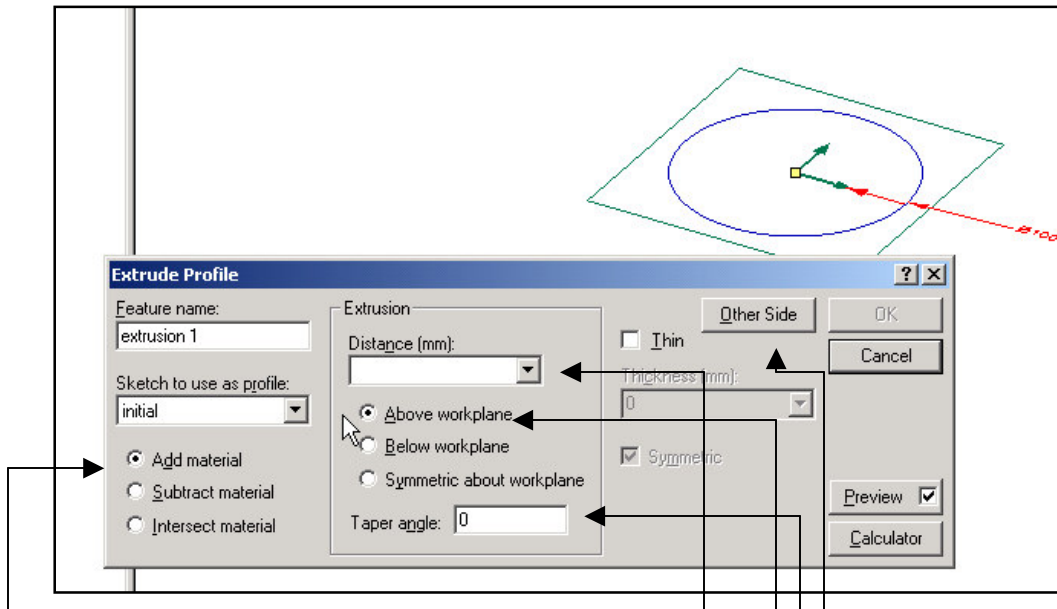


At the end of the line there will be a number tag with a symbol indicating that you have found out the diameter of the circle.


- Double click on that diameter tag two times; a new dialogue box will open. Enter 100 in this field labeled Length. This will change the diameter of the circle to 100 mm.





7. Select the Extrusion tool . [Alt + R > E]



8. In the dialogue box that opens up, you will need to:

- Enter 500 in the field labeled Distance.
- Make sure that Add Material is selected.
- Make sure that Above Workplane is selected.
- Make sure that Taper Angle is set to zero.
- Make sure that Thin is NOT selected.
- Click OK .

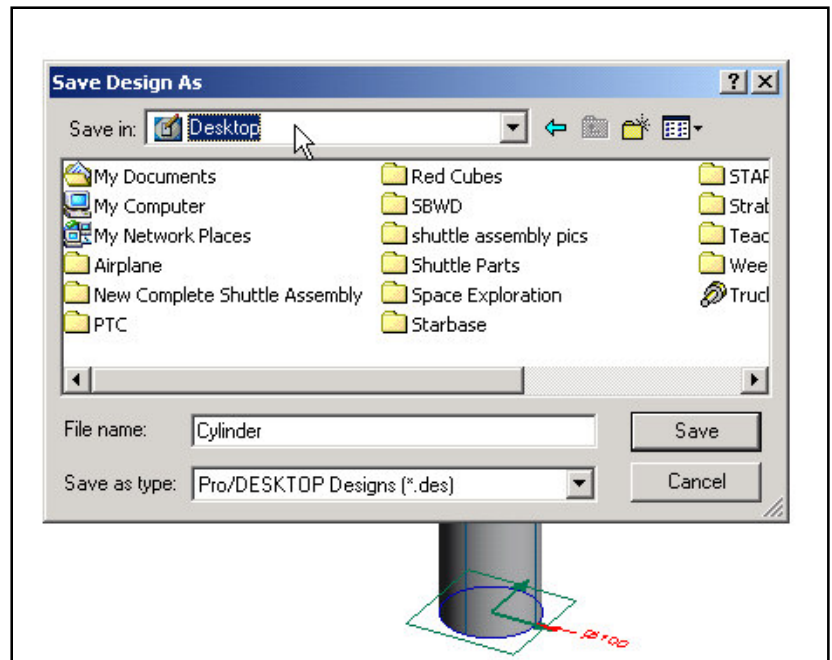
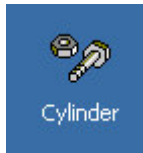
9. Now you have turned your circle into a cylinder with a diameter of 100mm and a length of 500mm.

*If your cylinder is too tall to fit on your screen, you will want to hit Autoscale . [Shift + A] That will make the whole cylinder fit. But if it is still too tall, you can either hit Half Scale , [Shift + H] or use the scroll wheel on the top of your mouse (some mice don't have scroll wheels).*



10. Next you will need to save this design.

- **File > Save>**
- **A dialogue box will open >**
- **Save to DESKTOP >**
- **Give the file a name; Cylinder makes sense.**
- **If you look on your desktop, you will find a new icon.**

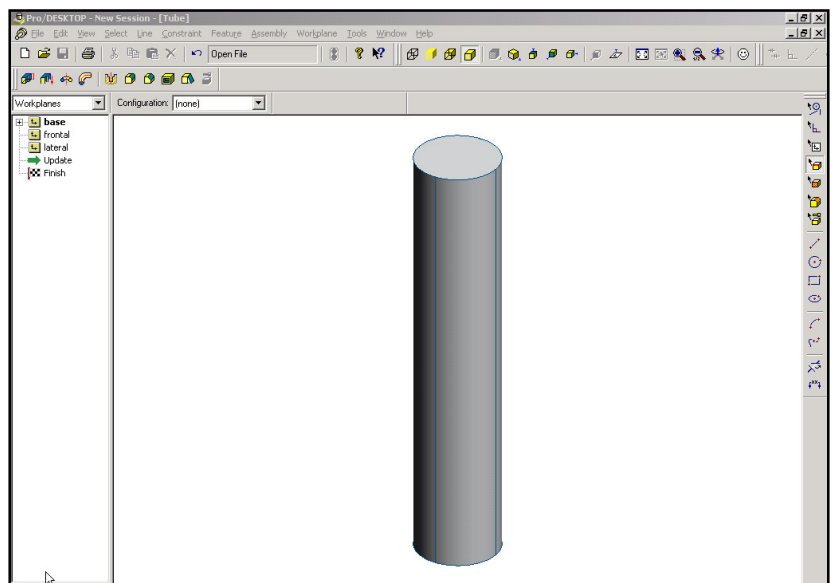


11. Now that this file has been saved, you can alter it and create a whole new design. First, you will need to save again only this time, saving as a copy, and giving it a new name. In this case, the name will give you a good hint as to what you will be making next.

- **File > Save Copy As >**
- **Save file as Tube.**

12. Open this new Tube file

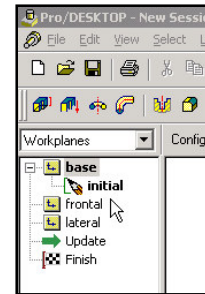
- a. **File > Open > select Tube.**
- b. **This new file will look just like Tube but now you are going to make some changes.**



13. With the new Tube file open, move your cursor over to the Object browser.

14. Notice that the Browser is in the Workplane mode.

15. See that the Workplane called **base** is highlighted? That means it is active; that is the workplane that contains the cylinder that you will change to a tube.

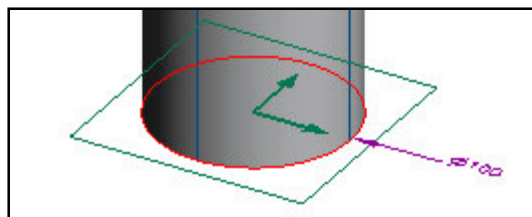
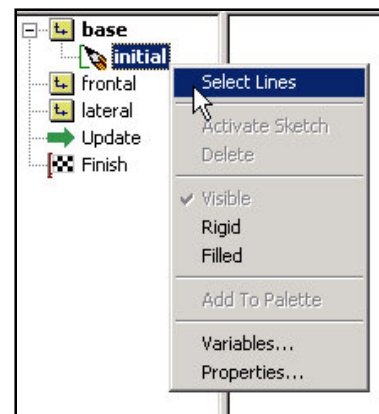


16. Click on the **plus sign** to the left of the base workplane, a pencil icon will appear; this indicates that a sketch has been attached to this workplane. This sketch is automatically called **initial**.

17. Click on the right mouse button and a new dialogue box will open up.

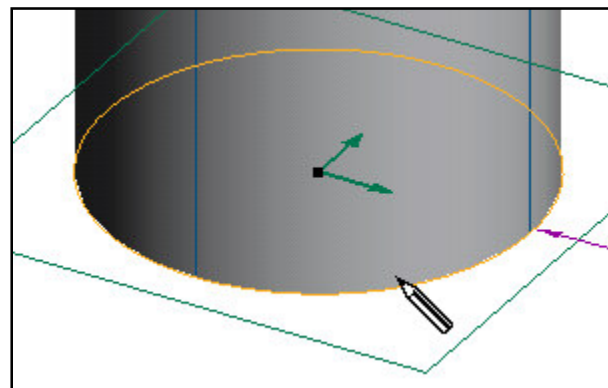
18. Choose the option to Select Lines.

19. Look back at your cylinder and the circle that defines its diameter will be red. That indicates that this line has been selected.

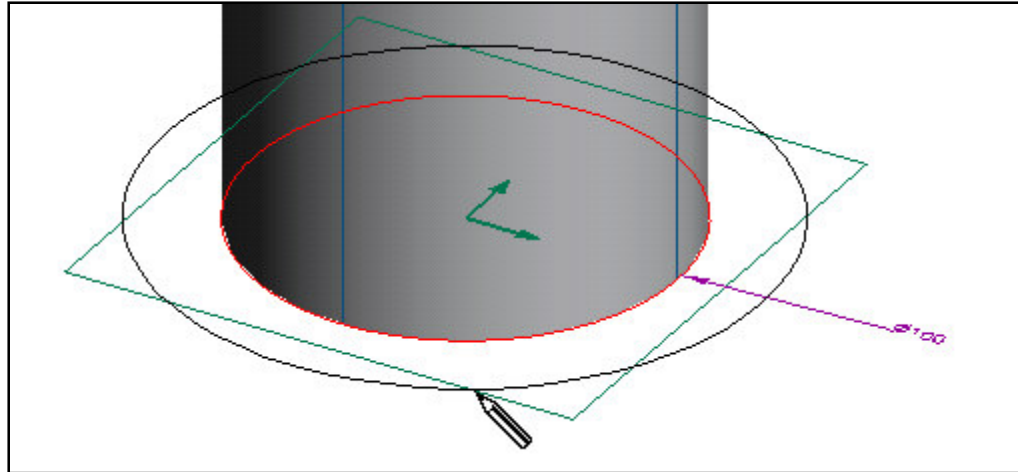


20. Select the Circle sketching tool again  [C].

21. As you move your cursor over the red circle, you will see a small black square. It will sometimes be ON the red circle and as you move just inside the red circle, the black square will move to the CENTER of the red circle.




22. When the black square is in the center, hold down the left mouse button and drag a new circle outside of the first one.




23. Set the diameter of this new circle to 150mm
- Follow the instructions in Step 6 to set the diameter.

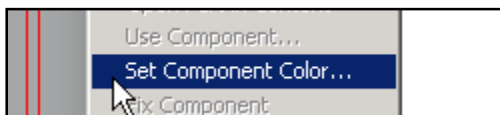
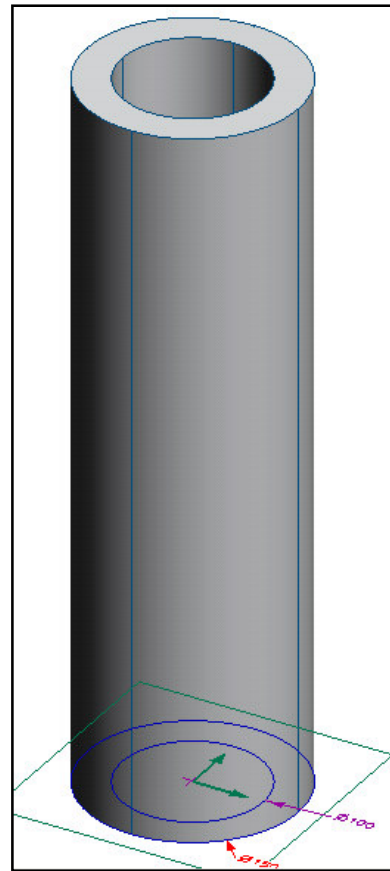
24. Autoscale the image on your screen  [Shift + A] so you can see it in its entirety.

25. If you look up at the top of the screen you should see a green traffic light symbol. This is called the update button  [F5]. A green traffic light indicates that a new instruction has been given to the computer and it is waiting for your permission to perform these instructions. Click on the update button.

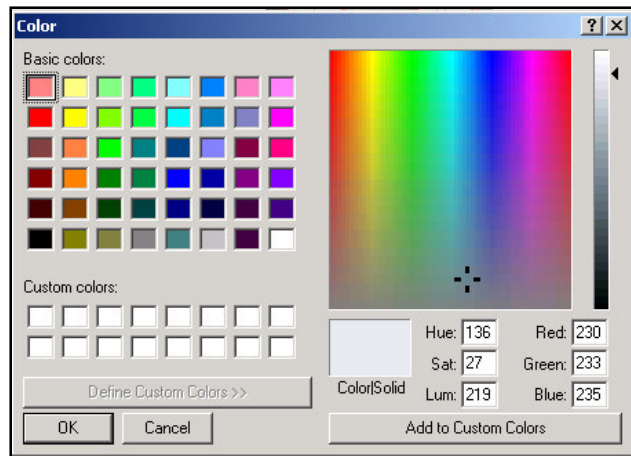
26. Now your cylinder has turned into a tube!

27. Next you will give this tube a new color.

- Click on the Select Part Icon  [P].
- Left click on the lines that define the tube. You will know that it has been selected when it turns red.
- With the Tube selected, click the right button on your mouse.
- A dropdown menu will appear.
- Select the option to Set Component Color.



28. Choose any color that you like and click on OK.



29. Now that you have these two files, Cylinder and Tub, you will need to assemble them in a new design file.

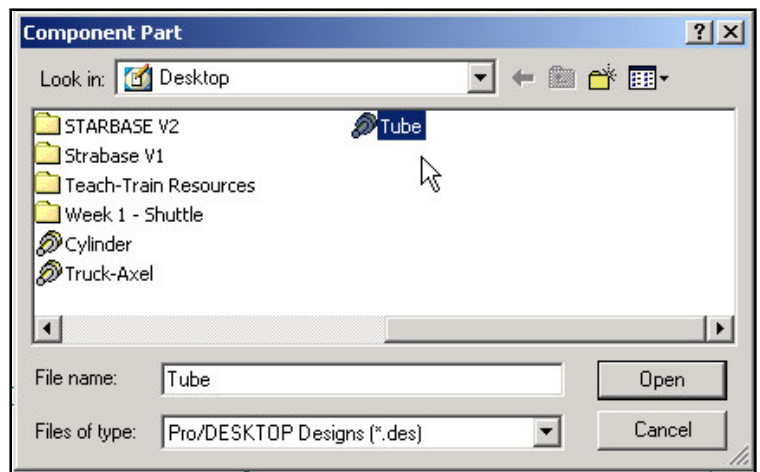
30. File > New > Design > OK.

31. Now you will import both files, one at a time.

32. In the File menu, select Assembly **Assembly**.

33. Go to Add new component, select Tube.

34. Now add the Cylinder.



35. The cylinder should be inside the tube. They need to be separated.

36. Click on the Select Part Icon  [P].

37. Click once on the tube so that the lines turn red.

38. Click again and a new icon will appear .

39. Click and drag the tube away from the cylinder

**Congratulations!** You have made a cylinder, created a new file from that design, turned it into a tube and brought them together in one new design.

