



3DXpert™ for SOLIDWORKS®

Adjust model for 3D Printing

Direct modeling tools

14,0200,1599,1024(SP2)

Sometimes, the model needs to be prepared or adapted for printing. Adding material, change of a draft angles are an example. In this exercise, we will learn the **Direct Modeling tools** to make some shape changes to the 3DP component.

This tools are named **Direct Modeling** since they can be applied for geometry changes to a model, regardless of the model's feature history.

This family of commands is Solid based, so that the result is a solid object as well:

Resize Round –the user can change the radius value of rounds (fillets).

Remove & Extend –the user pick face/s to remove and the system looks for extensions.

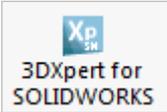
Direct Modeling – the user can apply several types of changes like: change draft angle, offset, move linear, move radial and replace.

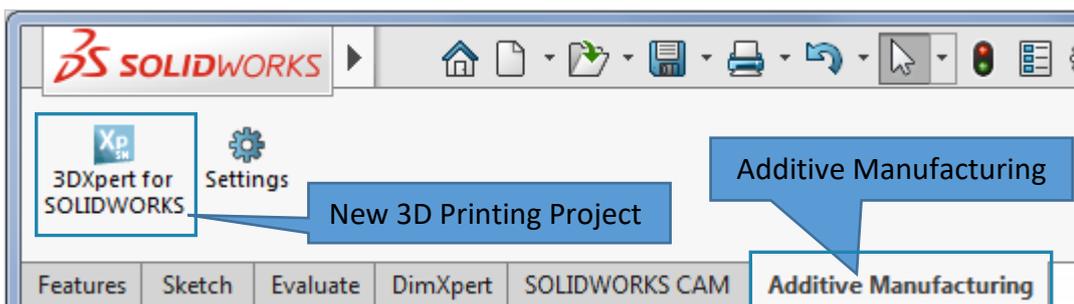
To use this command we need to follow few steps (guided):

- Load **Direct modeling tools Start.SLDPRT** to SOLIDWORKS
- Launch **3DXpert for SOLIDWORKS**.
- Use **Direct Modeling tools**.

 Notice/ Remember		Left mouse button name is " pick "
		Middle mouse button name is " Exit "
		Right mouse button name is " Click "

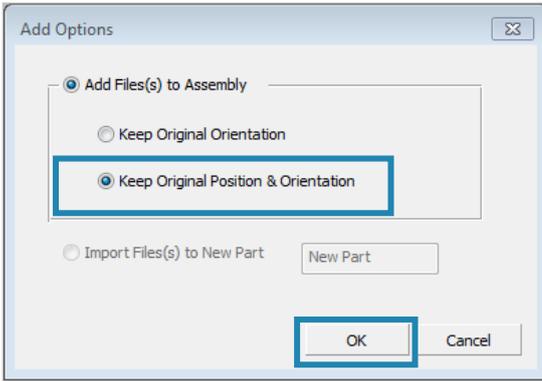
1. Load **Direct modeling tools Start.SLDPRT** to SOLIDWORKS from the folder that it was downloaded to.

2. From the Additive Manufacturing tab **pick 3XPert for SOLIDWORKS**  command.



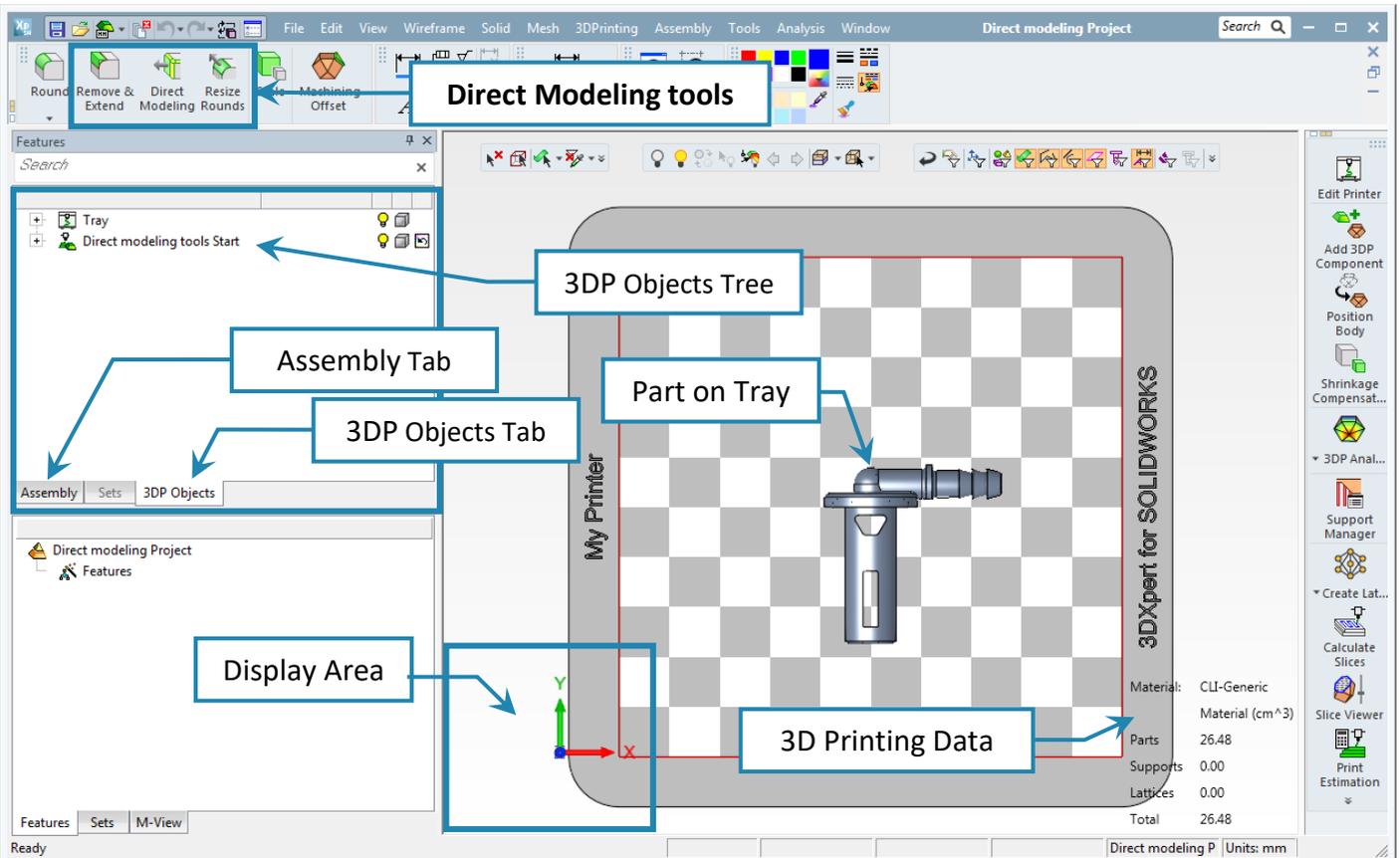
This command will launch **3DXpert for SOLIDWORKS**.

3. After the **3DXpert for SOLIDWORKS** is invoked, new window will open:



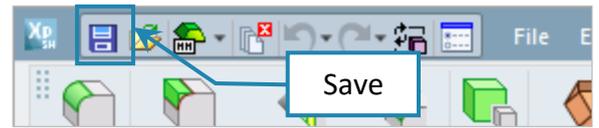
Pick Keep Original Position & Orientation and OK:

After the file is open the screen will look like this:

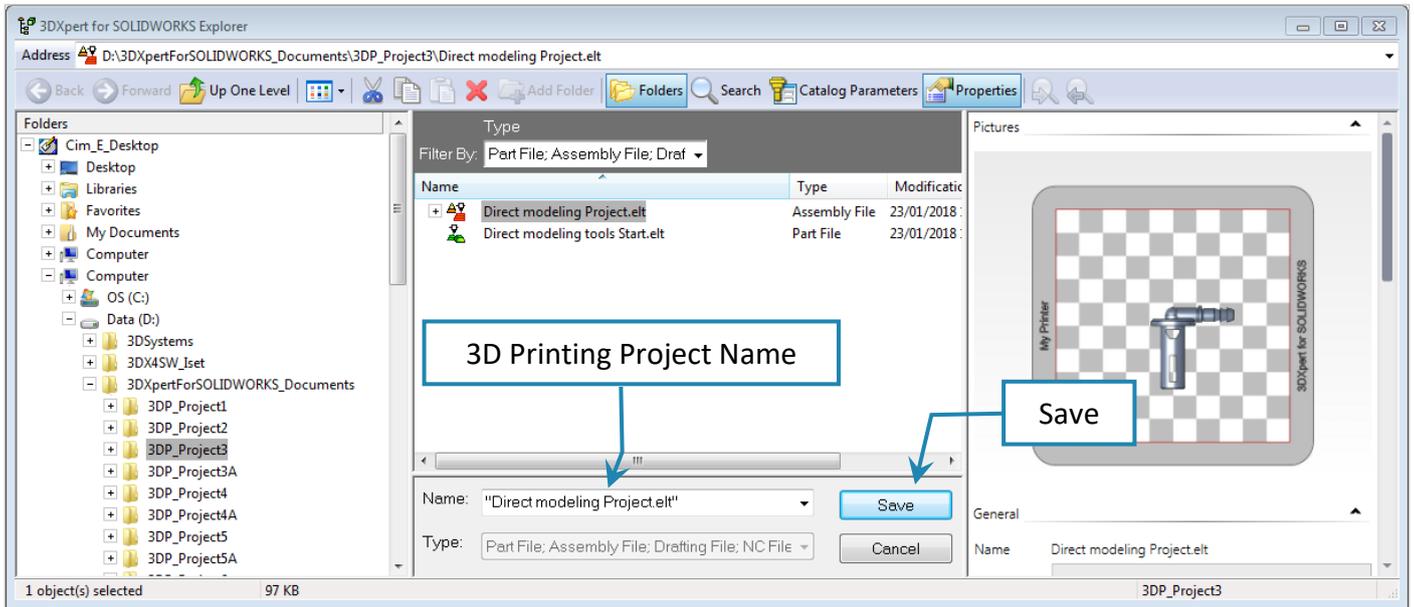


Notice that Direct Modeling tools are in the Main Toolbar at the top screen.

- Save the project, pick the Save  command on top left corner.

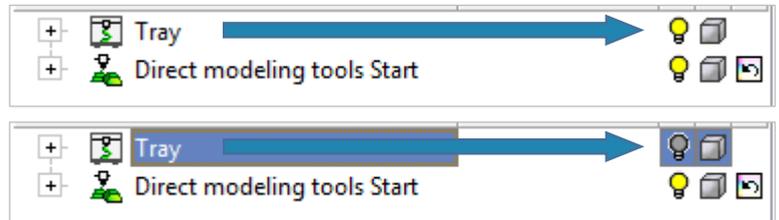


This command will open the **3DXpert for SOLIDWORKS Explorer**. Save the file to the same folder with the downloaded files.



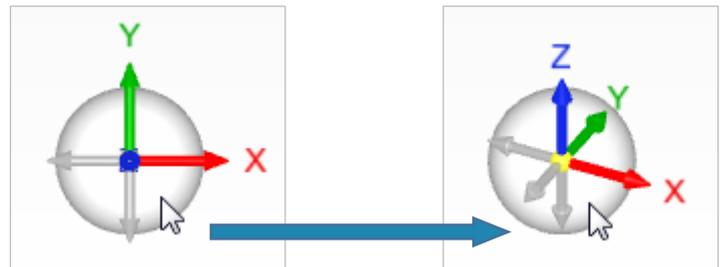
NOTE: For this exercise, the exact position is not important.

- Hide the Tray, from the 3DP Objects Tree **pick** the bulb of the Tray,

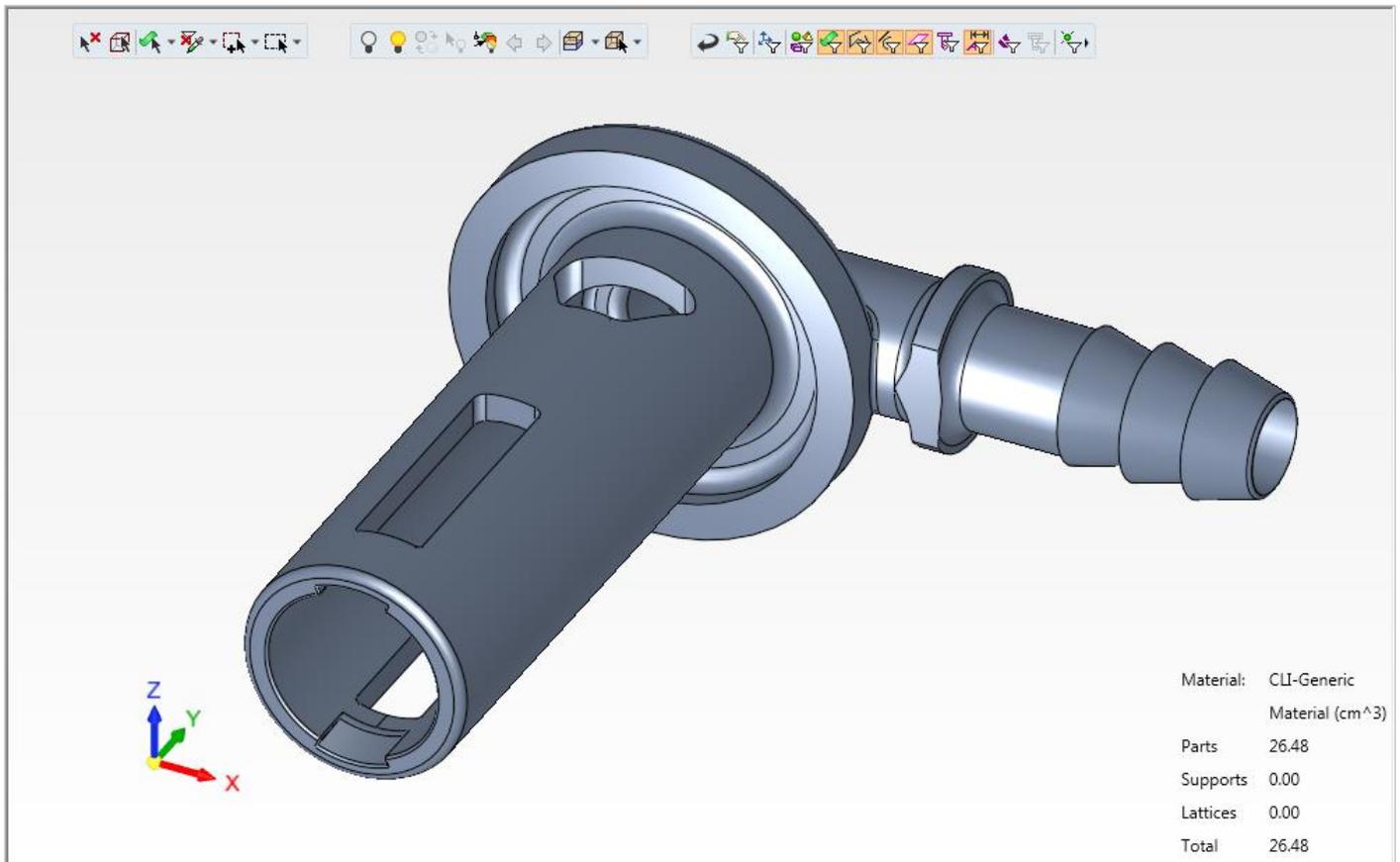


The bulb will turn grey and the Tray "disappears" from display.
At any time **pick** again to Show.

Click the white ball in the Display Area to get an ISO view on the part.



After hiding the tray the, **3DP component** will look like this from ISO view:

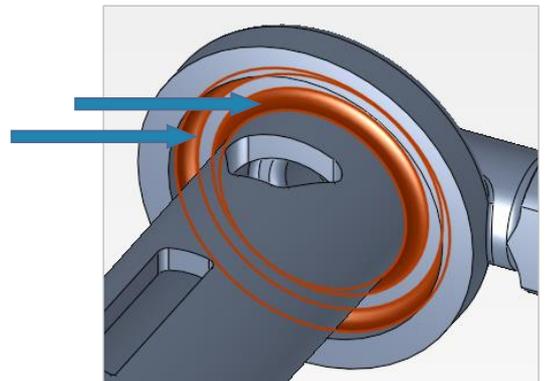




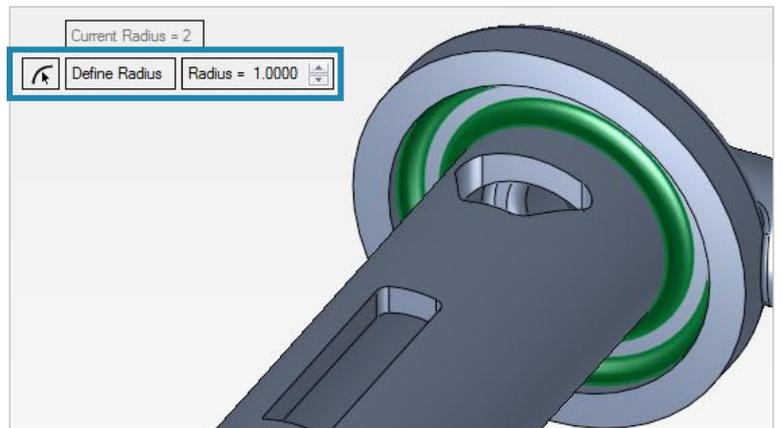
6. **Pick the Resize Round** command from the Main Toolbar.

	<p>Resize Round</p> <ol style="list-style-type: none"> 1) Pick rounds 2) Set parameters <p>To move from step 1) to 2) press Exit</p>
	<p>"Preview" the result without executing</p>
	<p>To approve and finish use the "OK"</p>
	<p>To approve and continue use the "Apply".</p>
	<p>"Cancel" – exit the comand without keep changes</p>

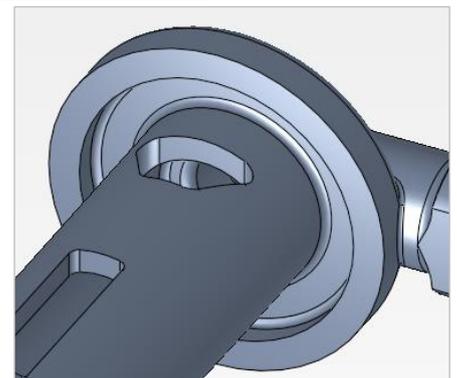
Pick 2 rounds as shown, Press **Exit** to next step.



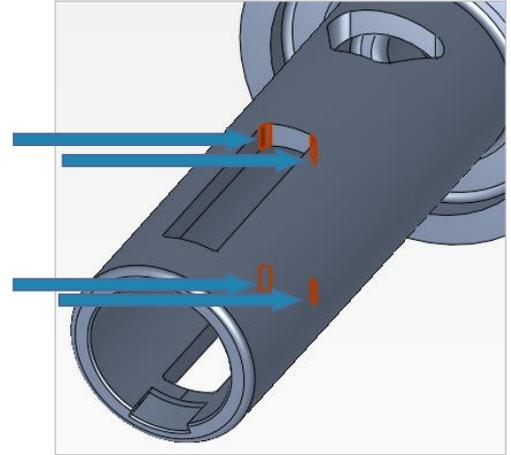
Set parameters as shown and **Apply**



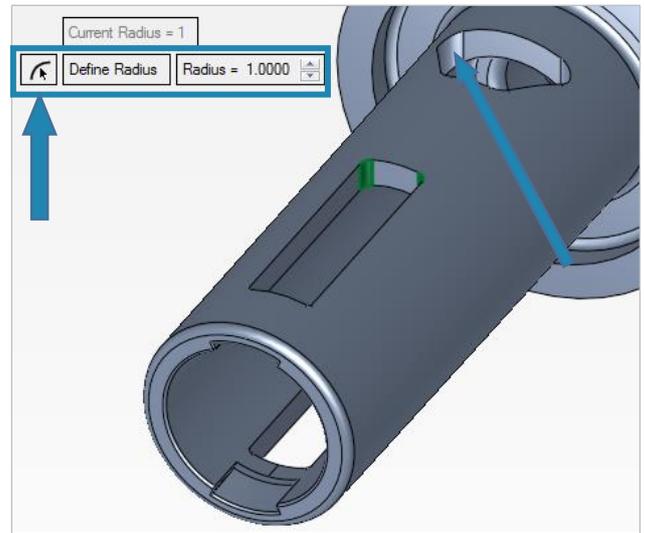
As a result the rounds became smaller, now set to R=1



7. **Pick** 4 rounds as shown,
Press **Exit** to next step.



Pick Define Radius  command, and **pick** the radius shown in the picture as reference.



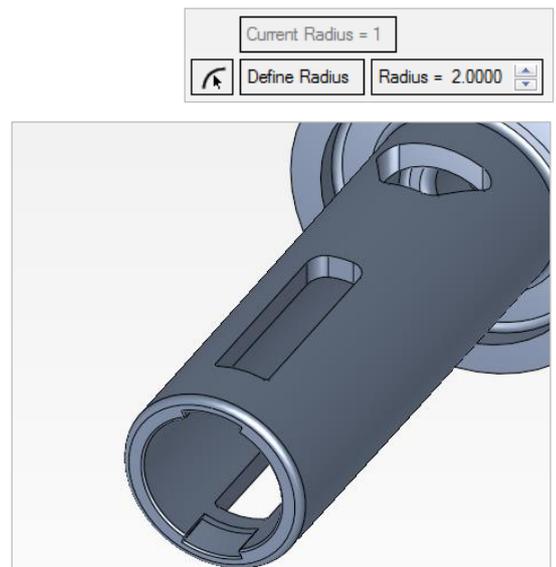
!

Please notice:

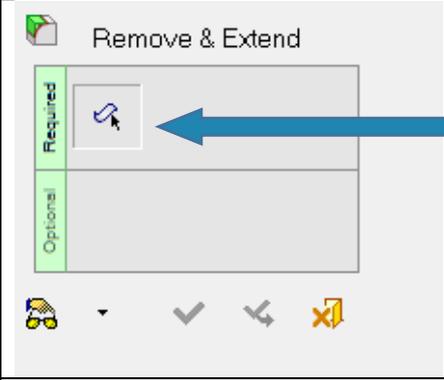
 Define a radius value for the selected faces, by using the button to **pick** a reference round and acquiring its radius as the value.

The value of the reference radius is set in.

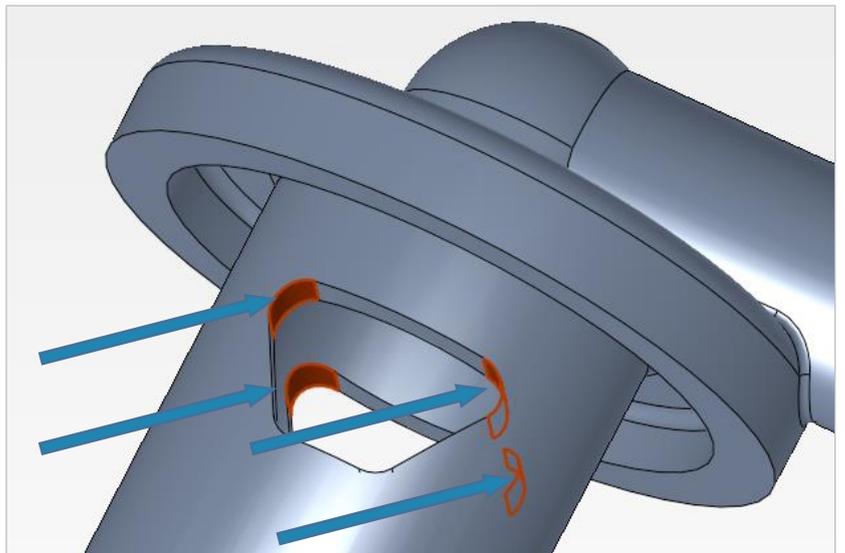
Pick Preview  and then **OK** .



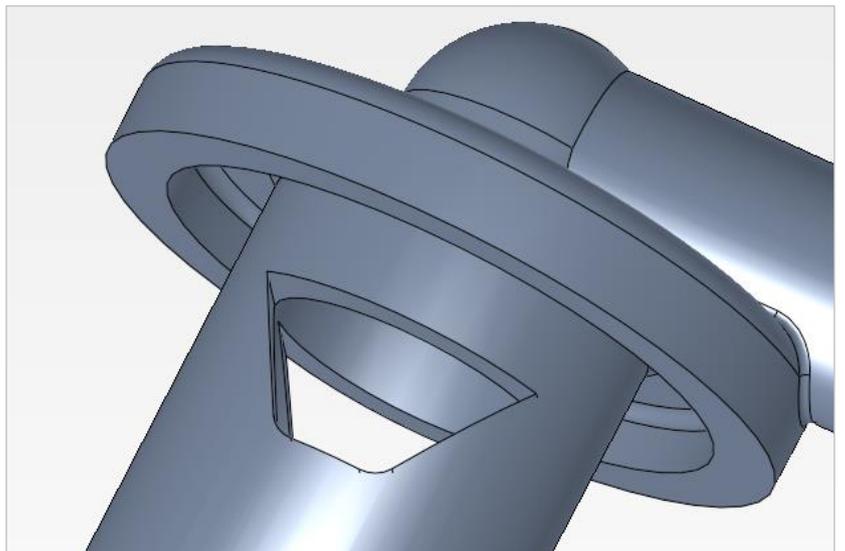
8. Pick the Remove & Extend  command from the Main Toolbar.

	 Remove & Extend
	1) Pick face(s) to be removed.
	"Preview" the result without executing
	To approve and finish use the "OK"
	To approve and continue use the "Apply" .
	"Cancel" – exit the comand without keep changes

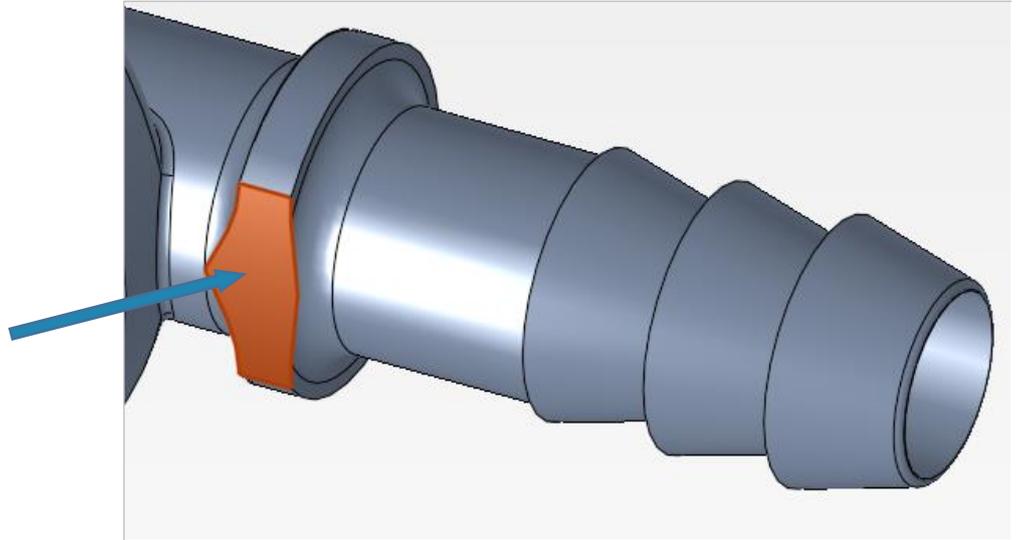
9. **Pick** 4 rounds as shown,



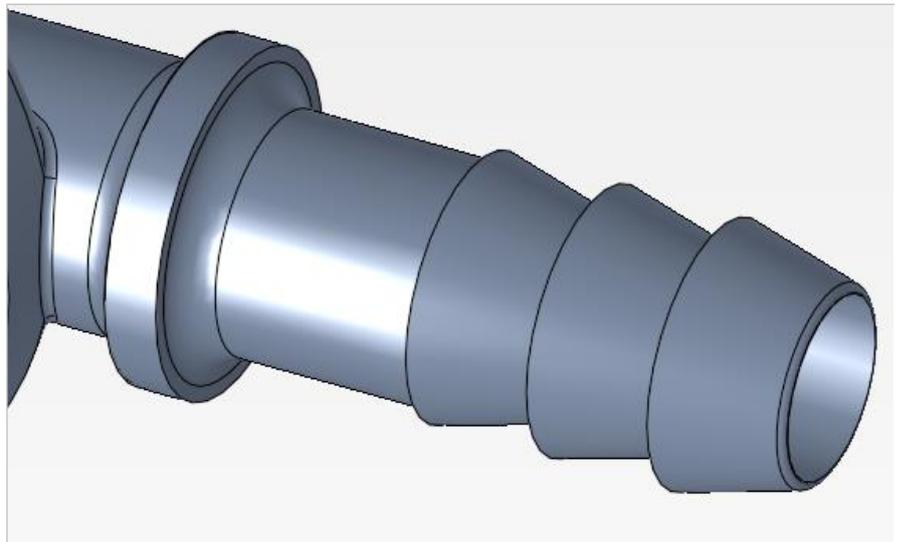
Pick Preview  and then **Apply** .



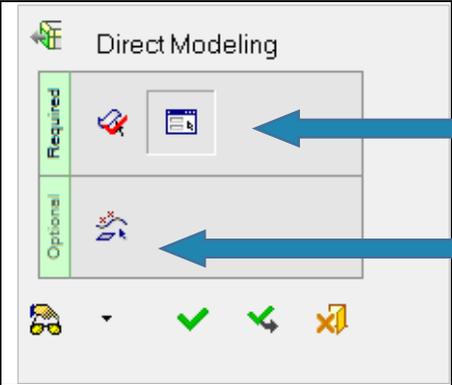
10. **Pick** the face as shown,



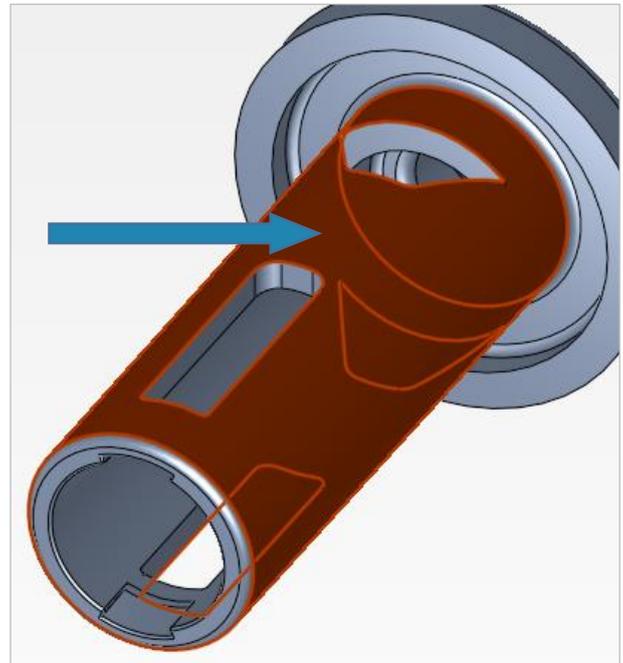
Pick Preview  and then **OK** .



11. **Pick the Direct Modeling**  command from the Main Toolbar.

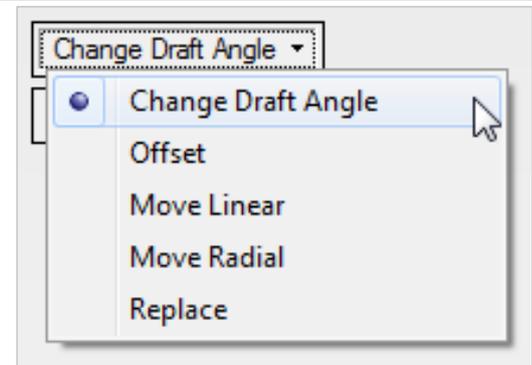
	 Direct Modeling
	<ol style="list-style-type: none"> 1) Pick face(s). 2) Select options and set parameters <p>To move from step 1) to 2) press Exit</p> <p>Option: Pick/unpick round faces</p>
	 "Preview" the result without executing
	 To approve and finish use the "OK"
	 To approve and continue use the "Apply" .
	 "Cancel" – exit the comand without keep changes

12. **Pick** the face as shown,
Press **Exit** to next step.



In the second step we have 5 major options:

- Change Draft Angle
- Offset
- Move Linear
- Move Radial
- Replace.

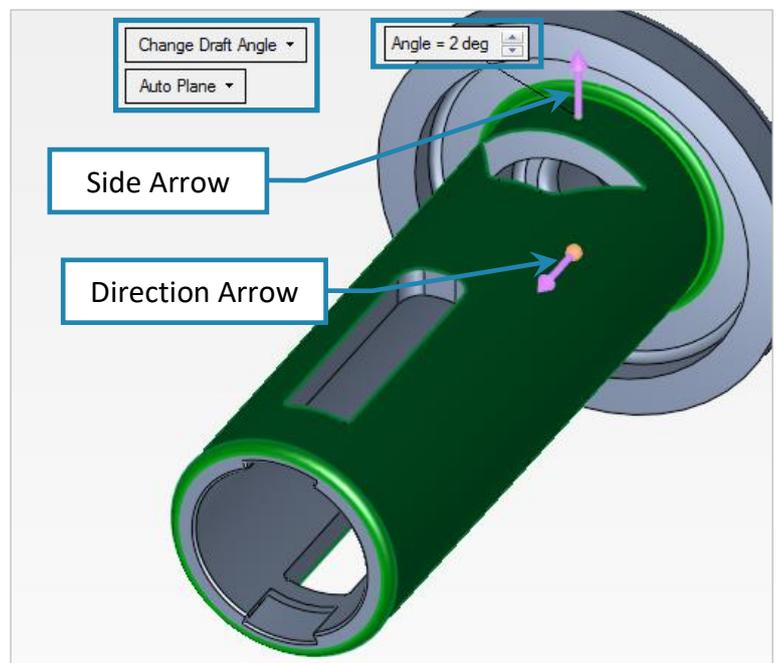


Pick Change Draft Angle option, and set parameters as shown:

The **Side Arrow**: determine the taper direction - outside or inside.

The **Direction Arrow** defines in this case the direction of normal to the plane, which is the plane according to which the angle will change. If needed, **pick** the **Direction Menu** by clicking on the ball in the base of the arrow.

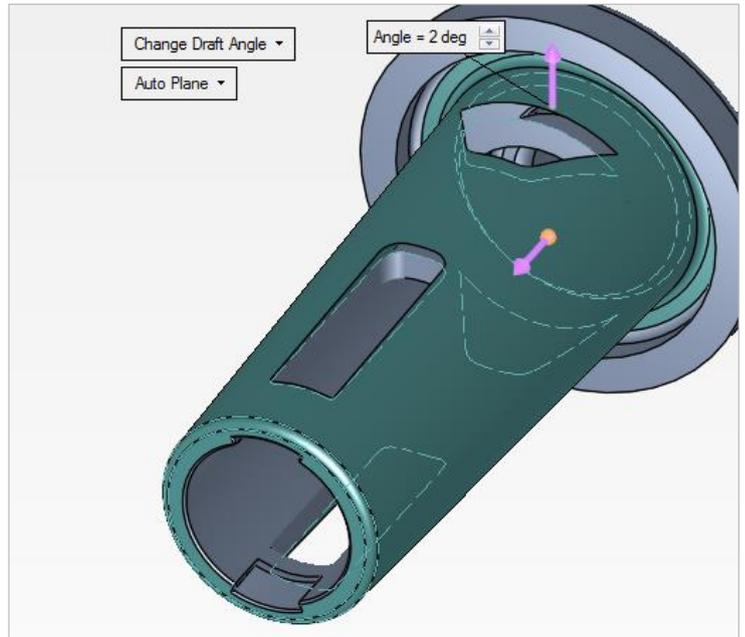
Auto Plane (can be changed to **Auto contour** or **Natural Plane**) is the reference plane, automatically selected based on the direction of the direction arrow.



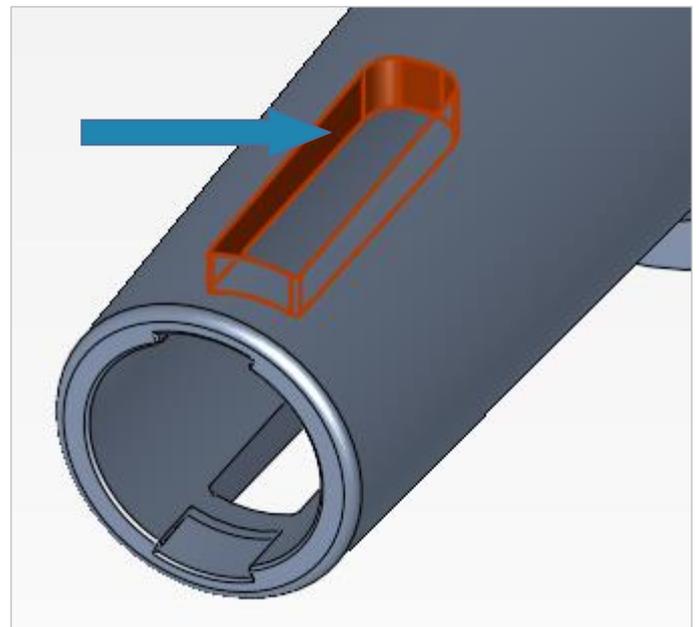
Pick Preview  ,

It is possible to see the result to be obtained, and in the dashed line to see the previous shape.

Pick Apply  .

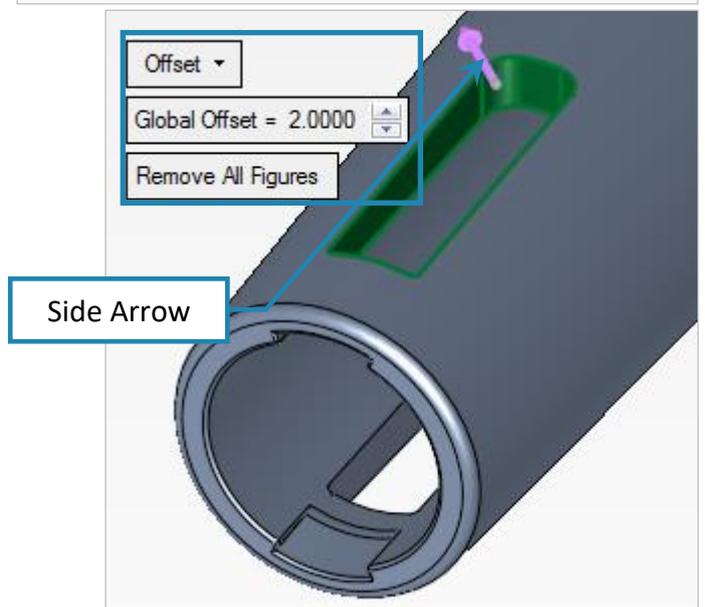


13. **Pick all** the faces as shown, Press **Exit** to next step.



Pick Offset option, and set parameters as shown:

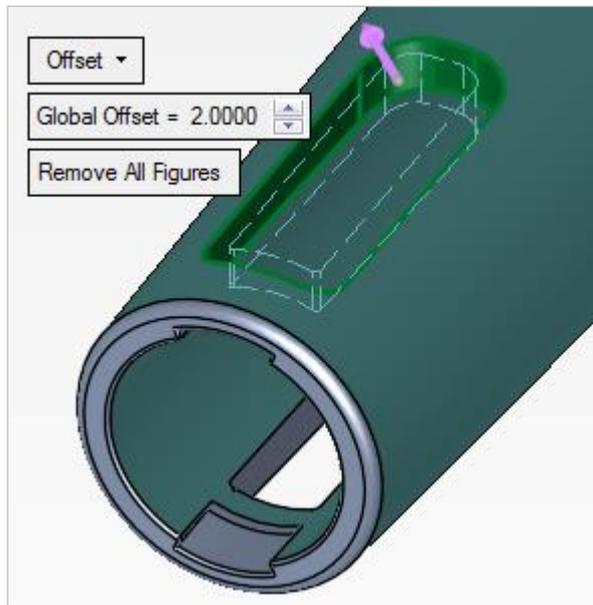
The **Side Arrow**: determine the offset side, outside or inside.
In this case we want it outside.



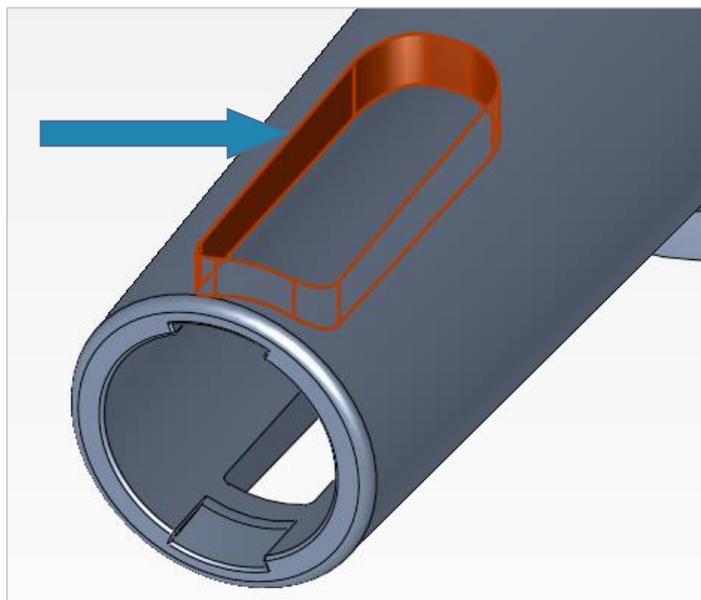
Pick Preview  ,

It is possible to see the result to be obtained, and in the dashed line to see the previous shape.

Pick Apply  .



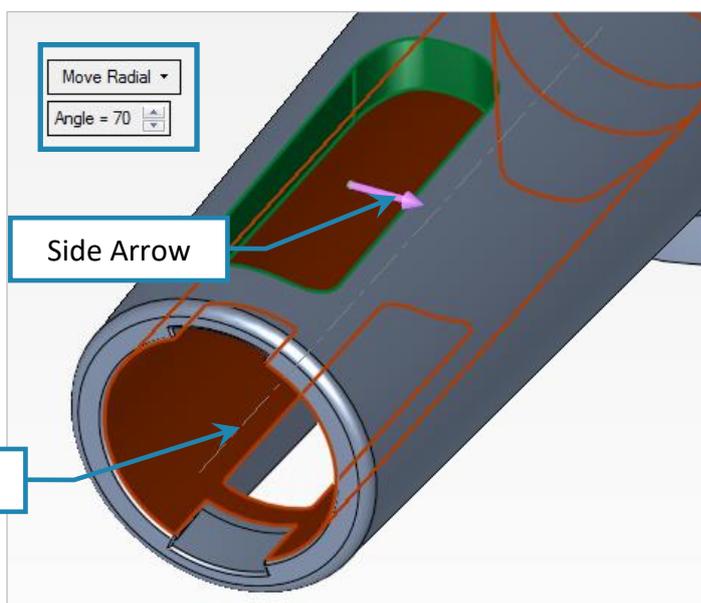
14. **Pick all** the faces as shown, Press **Exit** to next step.



Pick Move Radial option, and set parameters as shown:

In addition, **pick** the central **cylinder** as the **axis** of the radial movement.

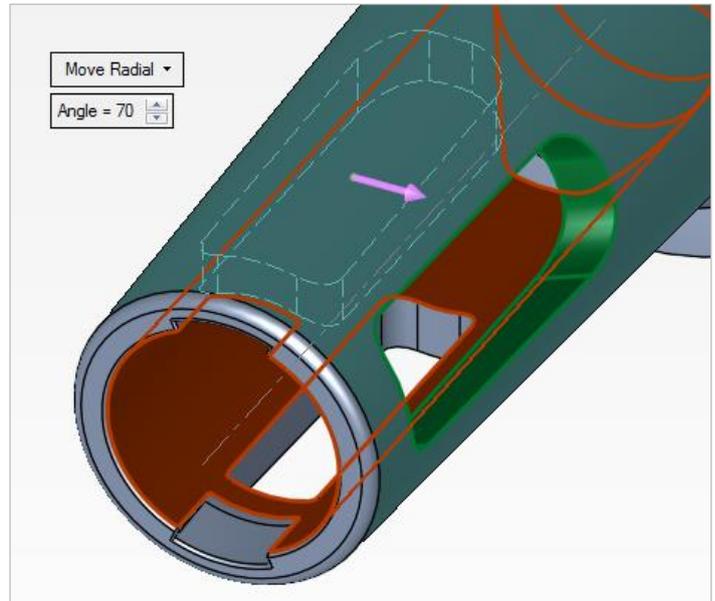
The **Side Arrow**: determine the side of the rotation, left or right.



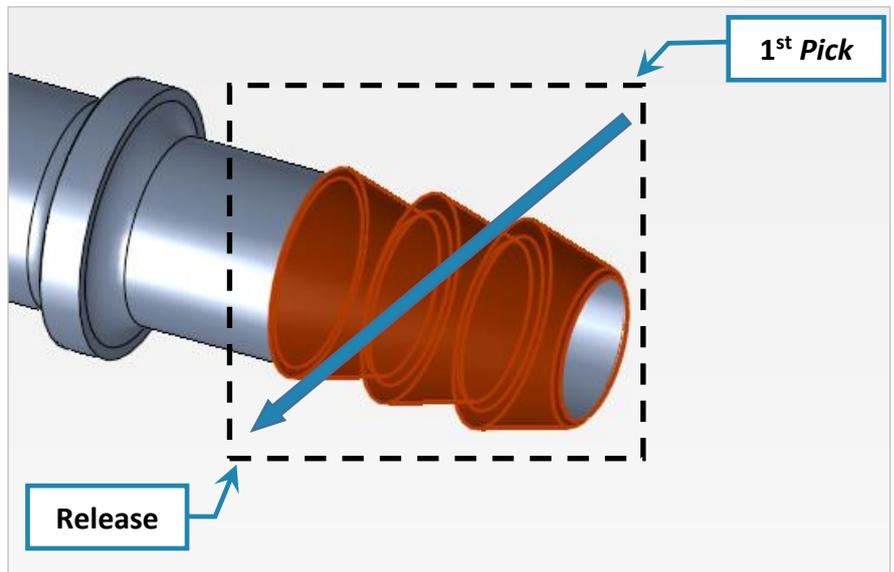
Pick Preview ,

It is possible to see the result to be obtained, and in the dashed line to see the previous shape.

Pick Apply .

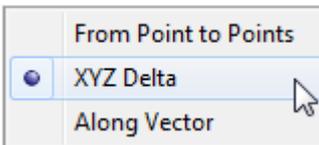


15. **Pick all** the faces as shown By Box, 1st **pick** top right and drag to bottom left, then release. Notice that while selecting, the box is dashed. Press **Exit** to next step.



Pick Move Linear option, and set parameters as shown:

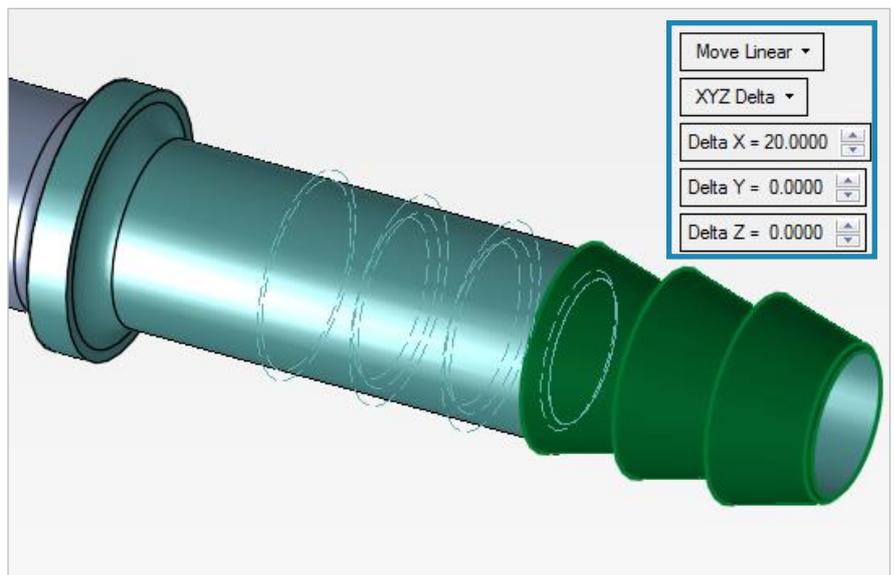
In **Move Linear** there are 3 options:



Pick Preview ,

It is possible to see the result to be obtained, and in the dashed line to see the previous shape.

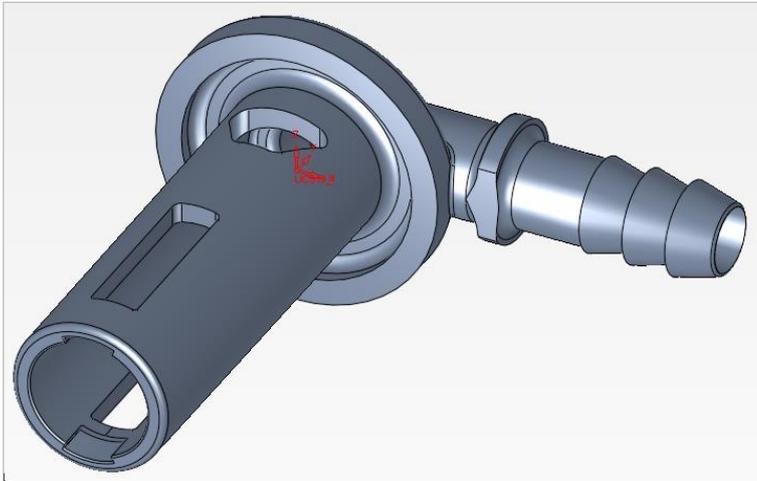
Pick OK .



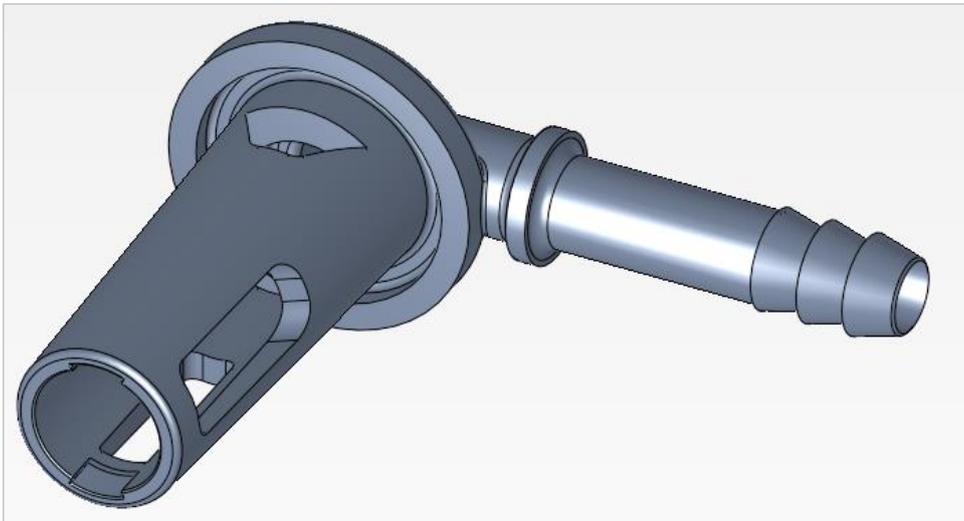


Please notice:
The option Replace in Direct Modeling requires the creation of face. This functionality is not included in the Standard package.

Part at Start



Part at the End



End of Exercise.