



# 3DPRINTING EXERCISE

## Zoning & Virtual Volumes

Tutorial\_V4: 143DXpertv14\_qa\_14.0000.1587.729

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In the first 3DXpert exercise, you have learned how to prepare a part for printing.

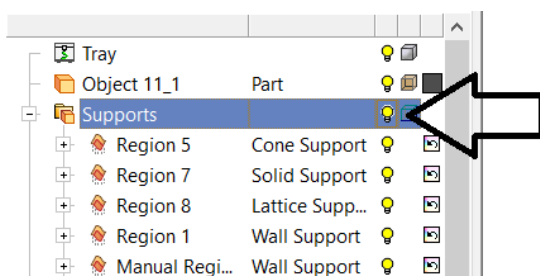
We have seen that different objects, such as the part or the different support, can get different technologies. Each technology translates to different scanpath and laser parameters on the printer.

However, if we want to print different areas in the same object with different technologies, we do not need to divide this object into different volumes. 3DXpert enables you to define separate technology areas by using simple volumetric shapes, thus keeping the model as a single object. Let's see how.

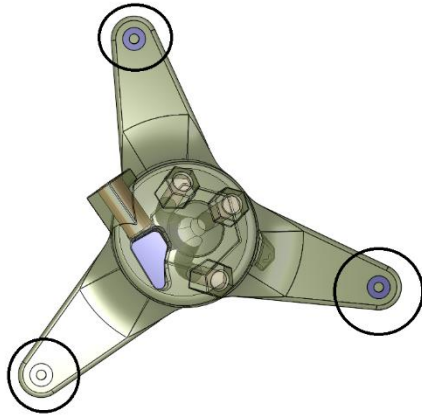
### Create a Virtual Volume

1. Load the file **Exercise1.elc** from the folder 'Result - Exe1'.


You can hide the supports by clicking the bulb to the right of the Supports leaf in the object's tree.



So let's say that we wish to define different printing technology zones in this part. For example, we want the outer areas of the 'wings' to be printed more 'finely'. These areas may be subjected to more forces or strains so a different printing technology should be used here.

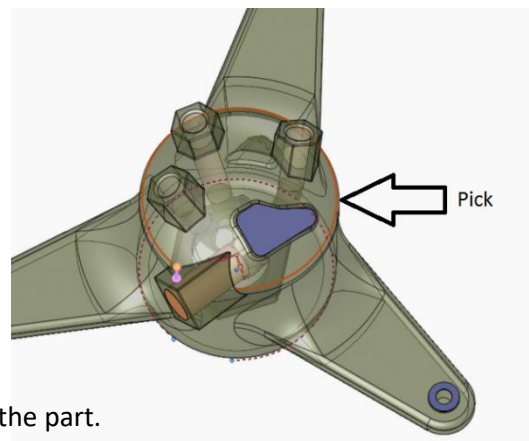


To do that, we will create a new object that overlaps with our part. We will then assign this new object with the required Technology and set it as a Virtual Volume. Let's create this new object.

2. Activate the Part. Click **Sketcher**  and click the middle mouse button to work on the main XY plane.
3. Click the **Add Reference** button.



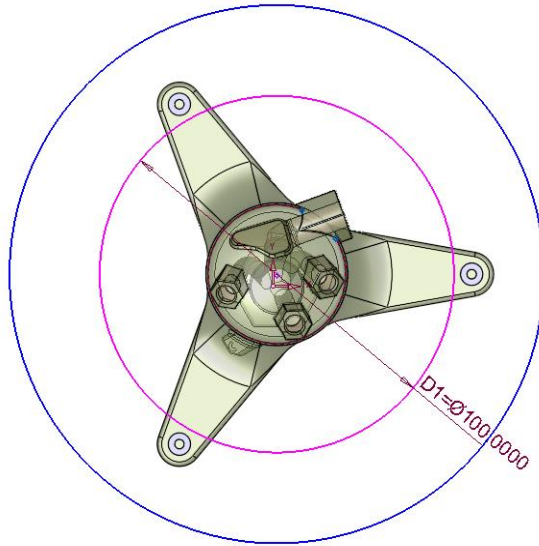
4. Pick the curve from the part, as shown:



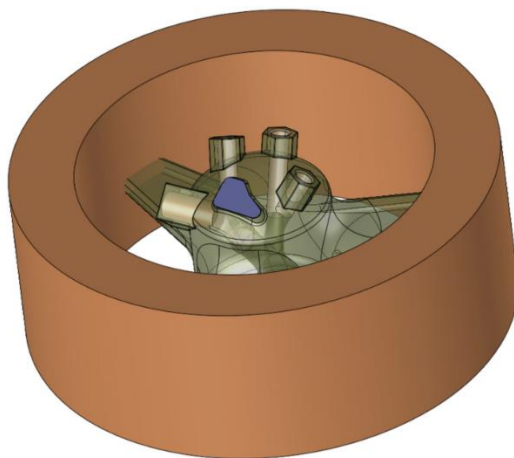
This creates a center point in the middle of the part.

5. Click the Z axes of the interactive UCS to switch to top view.

6. Click the Sketcher's Circle button and sketch two circles, each starting from the center point above. Set the inner circle a dimension of 100mm. the dimension of the outer circle is not important.  
So what we want here really is that all the material that is beyond 100mm to be printed in a different Technology, for example 'Print Fine'.

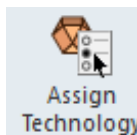


7. **Right Mouse Click** and press **OK** from the sub Menu to exit the Sketcher.
8. Press the **Extrude** Button (notice that as we exit the Sketch, the circles we have just drawn are already picked).
9. Switch from **Add** to **New**, set **By Delta** and enter a **Delta** value of **50mm**.




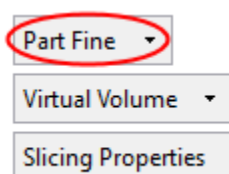
## Assign Technology

Now let's assign the technology to this object.



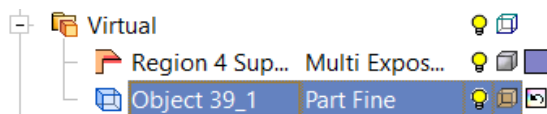
10. Click the **Assign Technology** icon

11. Pick the new object (set the Selection Filter to Objects , select the Technology 'Part Fine' and toggle Printed Volume to **Virtual Volume**. Select **OK**.



Note that each object can get a different slicing properties.

The Virtual Volume automatically gets a transparent color and is moved to the 'Virtual' folder in the object tree, alongside another virtual object created in Exercise 1 – the object defining Multi Exposure.



Remember that this 'ring' shaped object that we have created will not be printed. Its whole purpose is to define the volume so that everything (of the part) inside this volume will get the Technology 'Part Fine'.

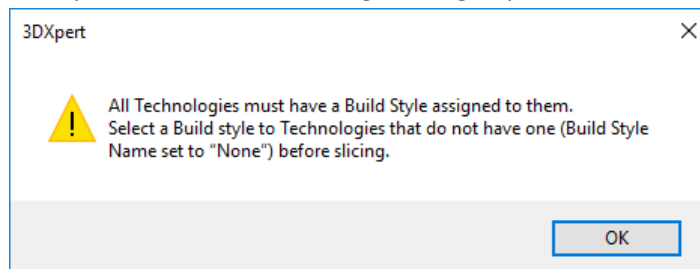
It can be seen that this ring body interferes with both the main part, the machining offset bodies and some supports. However, it has no effect on the supports' technology.

## Calculate Slices

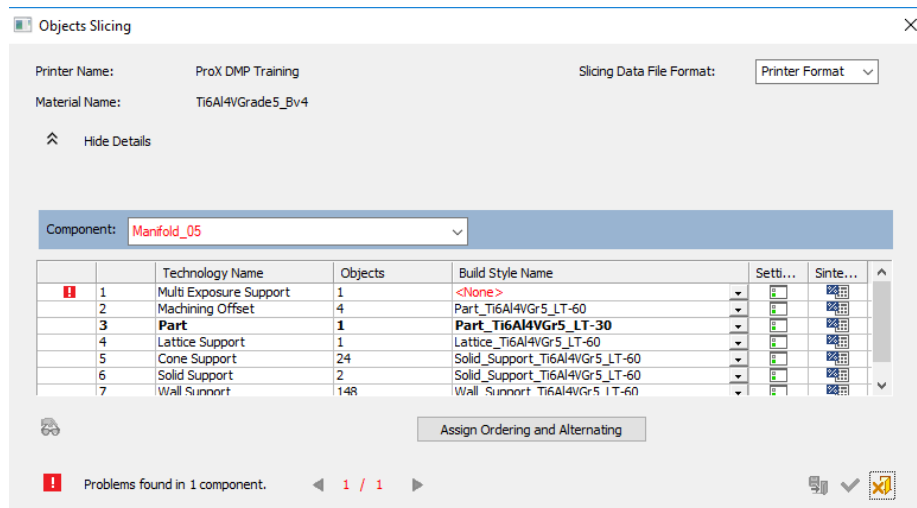


12. Press Calculate Slices

13. The system issue the following message - press **OK**.

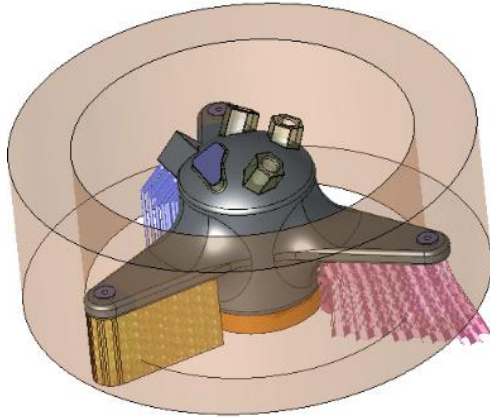


As you can see, a build style is not available with this material for a Multi Exposure Support:



14. Click on <None> and from the list select a Build Style to the Multi Exposure technology - choose a **Part Fine technology**)

Component: <span>Manifold_05</span>				
	Technology Name	Objects	Build Style Name	Setti...
1	Multi Exposure Support	1	<b>Part_Fine_Ti6Al4VGr5_LT-30</b>	
2	Machining Offset	4	Part_Ti6Al4VGr5_LT-60	
3	<b>Part</b>	<b>1</b>	<b>Part_Ti6Al4VGr5_LT-30</b>	
4	Part Fine	1	Part_Fine_Ti6Al4VGr5_LT-30	



15. Press **OK** to calculate the slicing.

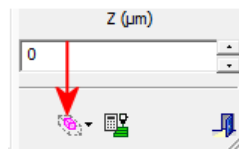
## Slice Viwer

16. After calculation is over, from the Guide press the Slice Viewer. .



You can now go through all the slices by moving the slide bar.

17. To see only the hatch patterns in each layer, hide the parts using the display button at the bottom of the navigation bar.



As you navigate through the layers which are going through the wings, you can see that the outer area of each wing is somewhat different than the rest of the wing area. This is because of the different technology used in that area.

Save the result

End of exercise.

