

Plate With a Hole - Physics Setup

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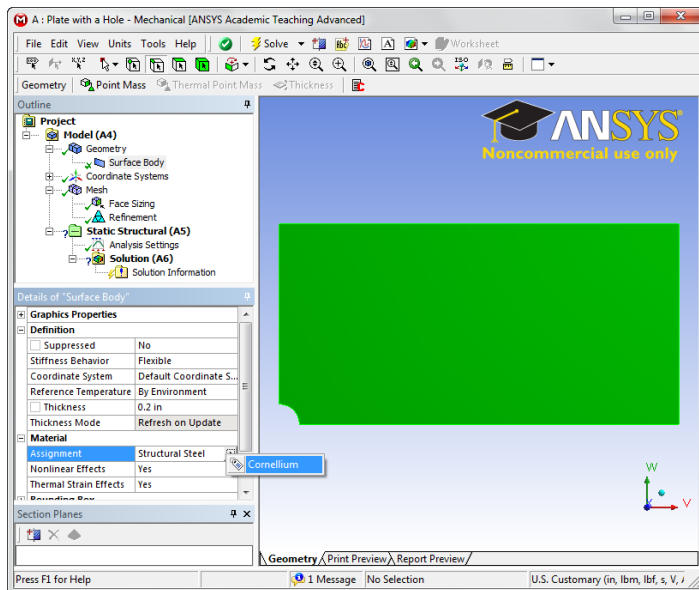
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Physics Setup

Specify Material

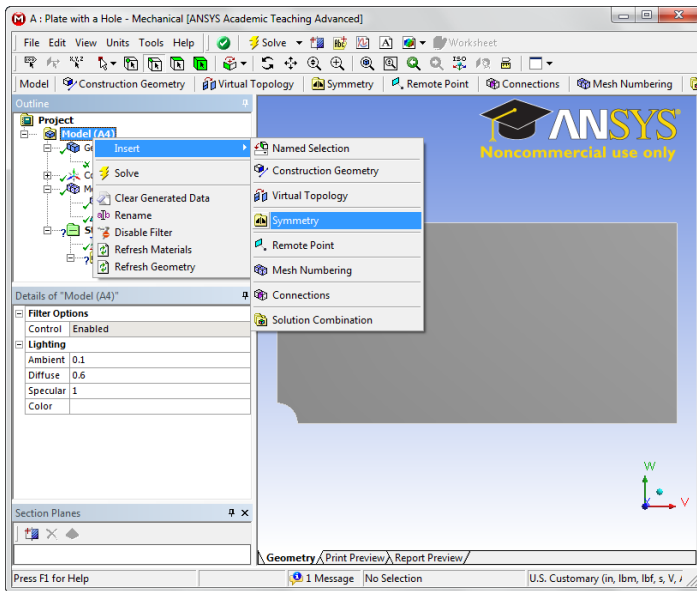
First, we will tell ANSYS which material we are using for the simulation. Expand **Geometry**, and click **Surface Body** in the *Outline* window. In the *Details* window, select **Material > Assignment > Cornellium**. The material has now been specified.




[Click here to enlarge](#)

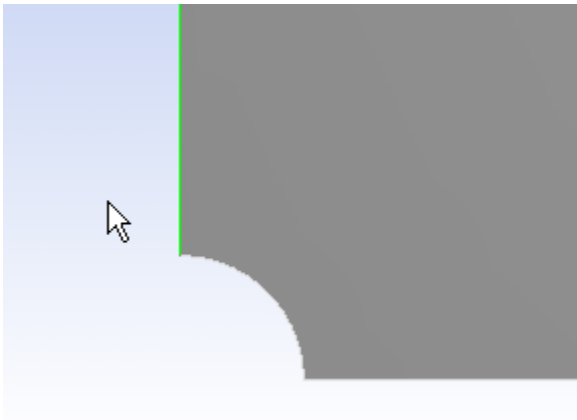
Symmetry Conditions

First, let's start by declaring the symmetry conditions in the problem. Right click **Model > Insert > Symmetry**.



[Click here to enlarge](#)

This will create a symmetry folder in the outline tree  **Symmetry**. Now, right click **Symmetry > Insert > Symmetry Region**. Make sure the Edge Select Tool is highlighted and select the left edge above the hole.

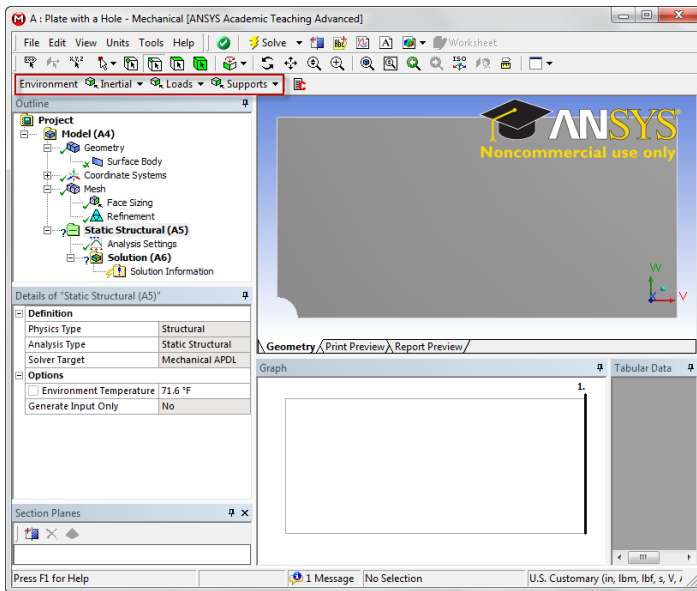


Now look to the Details View window and select **Geometry > Apply**. This should create a red line with a tag on the model. Ensure that under **Symmetry Normal** the x-axis is selected. Repeat this process to create a symmetry region for the bottom edge to the right of the hole, but this time making sure that the **Symmetry Normal** parameter is the y-axis.

Details of "Symmetry Region 2"	
Scope	
Scoping Method	Geometry Selection
Geometry	1 Edge
Definition	
Scope Mode	Manual
Type	Symmetric
Coordinate System	Global Coordinate System
Symmetry Normal	Y Axis
Suppressed	No

Forces

Now, we can specify the forces on the body. Click **Static Structural** in the outline tree. This will bring up the Physics Sub-Menu bar in the Menu Bar.



[Click here to enlarge](#)

Click **Loads > Pressure** to specify a traction. Select the right edge of the geometry and apply it in the details view window. The pressure's magnitude from the problem specification is $-1e6$ psi (pressure in ANSYS defaults to compression, and we need tension, hence the negative sign). Now that the forces have been set, we need to set up the solution before we solve.

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