

Modal Analysis of a Wing - Mesh

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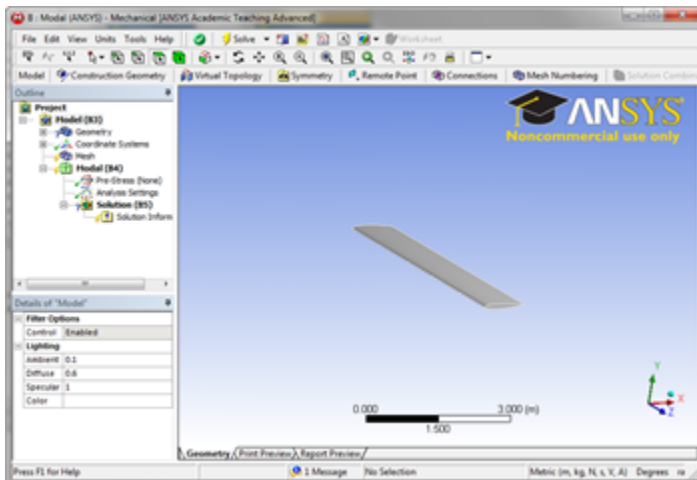
Mesh

Open the Mesher

To open the mesher, double click the Model box  **Model**. You should now be able to see the airfoil geometry.



in the *Project Outline* window. This will load ANSYS Mechanical.



Meshing Warning


If you see an warning stating that the surfaces are higher order NURBS, ignore it: it simply says that creating the mesh may take a while to generate, but I've never had to wait more than a minute.

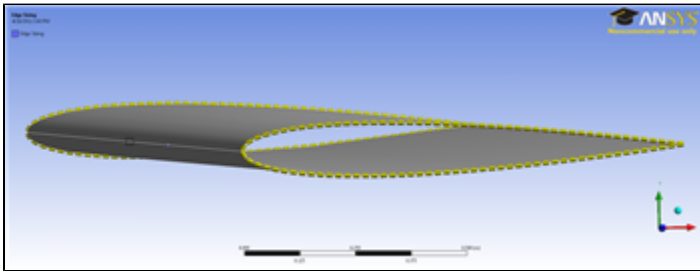
The first thing we are going to need to do when the mesher opens is specify the thickness of the airfoil walls. In the *Outline* window, expand **Geometry** and select **Surface Body**. In the *Details* window, change the thickness to 0.01 m . We also need to specify the material. In the *Outline* window. In the *Details* window, select **Material > Assignment > Al 6061-T6**. The material has now been specified.

Mapped Face Meshing

To apply a mapped face meshing, first click on **Mesh** in the *Outline* window. This will bring up the Meshing Menu Bar at the top of the screen. Next, select **Mesh Control > Mapped Face Meshing**. Select the 2 faces of the mesh by holding down the left mouse button and dragging over the entire geometry. In the *Details* window, click **Geometry > Apply** - it should say 2 faces are selected.

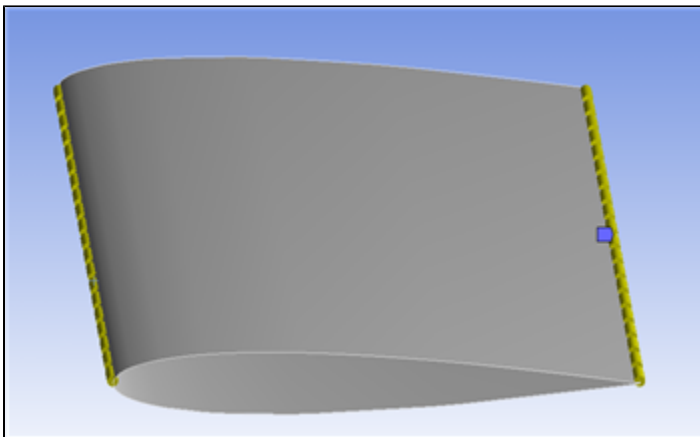
Edge Sizing

In the Meshing Menu, click **Meshing Control > Sizing**. Click the edge selection filter . Select the 4 curved edges on the outside of the geometry that make up the shape of the NACA 0012 Airfoil as the picture shows:

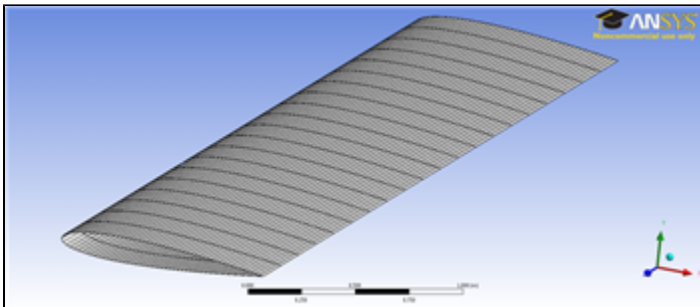


In the details window, select **Geometry > Apply**, and select **Type > Number of Divisions**. Change the **Number of Divisions** to 50. Also, change **Behavior > Hard**.

Next, create another Edge Sizing, and this time, select the 2 edges at the very front and very back of the airfoil that run along the wingspan, as the picture shows:



Again, in the *Details* window change the settings such that **Type > Number of Divisions** and **Behavior > Hard**. This time, change the **Number of Divisions** to 20. Generate the mesh by selecting **Mesh > Generate Mesh**.



[Click here to enlarge](#)

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