

Modal Analysis of a Wing - Mesh

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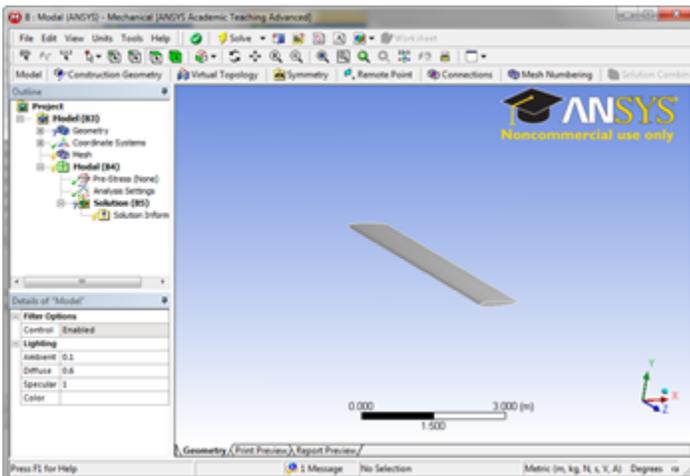
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Mesh

Open the Mesher

To open the mesher, double click the Model box  Model  in the *Project Outline* window. This will load ANSYS Mechanical. You should now be able to see the airfoil geometry.



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.

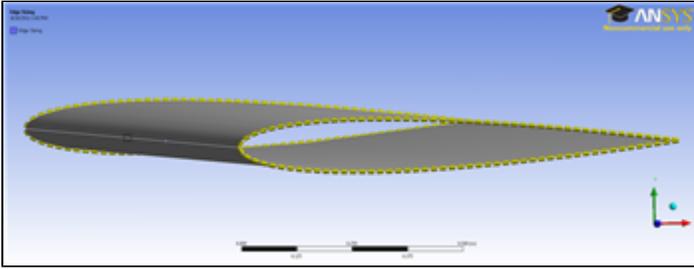
The first thing we are going to need to do when the mesher opens is specify the thickness of the airfoil walls. In the *Outline* window, expand **Geometry** and select **Surface Body**. In the *Details* window, change the thickness to 0.01 m. We also need to specify the material. In the *Outline* window. 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.

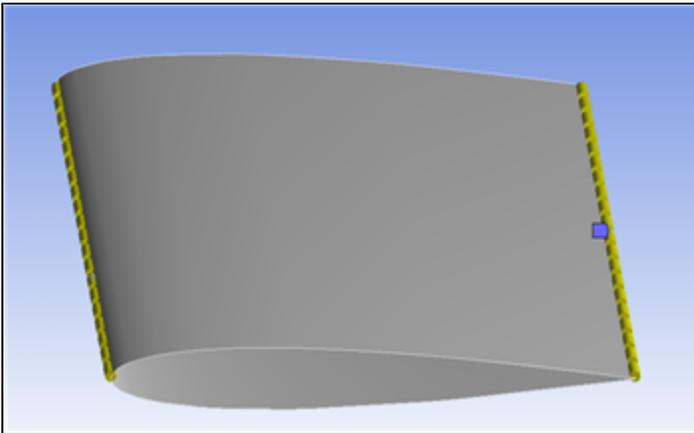
Edge Sizing

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:

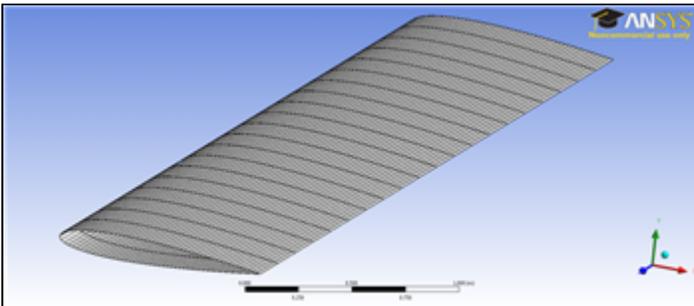


In the details window, select **Geometry > Apply**, and select **Type > Number of Divisions**. Change the **Number of Divisions** to 50. Also, change **Behavior > Hard**.

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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