AIM Backwards Facing Step - Physics Set-Up

Author(s): Sebastian Vecchi, ANSYS Inc.

Physics Set-Up

Create New Material

In the problem specification, a density and viscosity are defined for the fluid flow that do not match those of the material sample of air. A new material must be defined with the properties that we wish to have. Select **Material Assignments** and, in the **Material** drop down menu, choose **Create New**. In the gas properties window, using the **Add** drop down menu, select **Density** and **Viscosity**. Input the values given in the problem specification for the appropriate properties.

Boundary Conditions / Forces

First, the inlet must be defined using the Fluid Flow Conditions. In the **Add** drop down menu by **Fluid Flow** Conditions, select **Inlet.** Then, using the face selection tool, define the inlet as the plane perpendicular to the top step. Make sure to input the **velocity magnitude** as 0.4 m/s.

Once the inlet is defined, the outlet is next. In the same drop down menu, define an **Outlet** at the end of the step. Assign a **Gauge static pressure** of 0 psi.

Create an opening for the top of the flow volume by selecting **Opening** in the **Add** drop down menu. Select the top face of the flow volume and input 0 Pa for the **Gauge entrainment pressure**.

Add a **Symmetry** condition from the **Add** drop down menu to the sides of the flow volume. Do not select the faces at the beginning and end of the steps.

Next, a **Wall** condition must be added to all surfaces that are not already defined. **Wall** can be found in the same **Add** menu as the previous conditions. AIM will automatically create the walls once the option is selected; AIM selects every face that doesn't already have a boundary condition on it.

Go to Step 5: Results

Go to all ANSYS AIM Learning Modules