

Steady Flow Past a Cylinder - Pre-Analysis & Start-Up

Authors: John Singleton and Rajesh Bhaskaran, Cornell University

Problem Specification

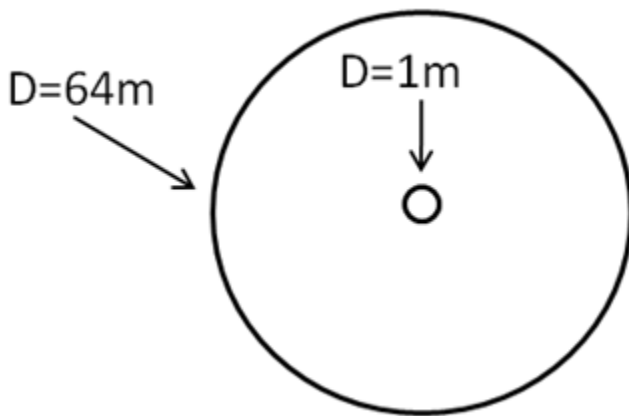
1. Pre-Analysis & Start-Up
 2. Geometry
 3. Mesh
 4. Physics Setup
 5. Numerical Solution
 6. Numerical Results
 7. Verification & Validation
- [Exercises](#)
[Comments](#)

Pre-Analysis & Start-Up

Prior to opening FLUENT, we must answer a couple of questions. We must determine what our solution domain is and what the boundary conditions are.

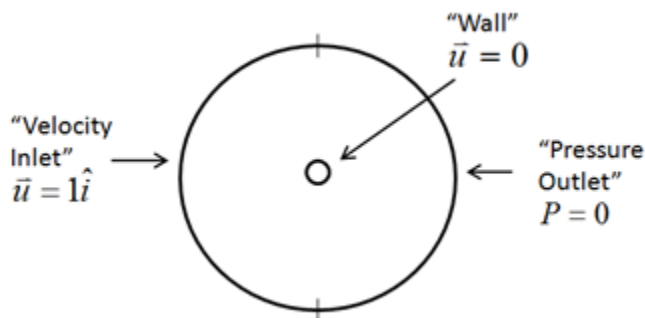
Solution Domain

For an external flow problem like this, one needs to determine where to place the outer boundary. A circular domain will be used for this simulation. The effects that the cylinder has on the flow extend far. Thus, the outer boundary will be set to be 64 times as large as the diameter of the cylinder. That is, the outer boundary will be a circle with a diameter of 64 m. The solution domain discussed here is illustrated below.



Boundary Conditions

First, we will specify a velocity inlet boundary condition. We will set the left half of the outer boundary as a velocity inlet with a velocity of 1 m/s in the x direction. Next, we will use a pressure outlet boundary condition for the right half of the outer boundary with a gauge pressure of 0 Pa. Lastly, we will apply a no slip boundary condition to the cylinder wall. The aforementioned boundary conditions are illustrated below.



[Go to Step 2: Geometry](#)

[Go to all FLUENT Learning Modules](#)