

FLUENT - Steady Flow Past a Cylinder - Problem Specification

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Problem Specification

1. Create Geometry in GAMBIT
 2. Mesh Geometry in GAMBIT
 3. Specify Boundary Types in GAMBIT
 4. Set Up Problem in FLUENT
 5. Solve!
 6. Analyze Results
 7. Refine Mesh
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Problem Specification



The purpose of this tutorial is to illustrate the setup and solution of a steady flow past a circular cylinder. Flow past a circular cylinder is one of the classical problems of fluid mechanics. For this problem, we will be looking at Reynolds number of 20.

$$Re = \frac{\rho V D}{\mu}$$

We know $D = 2$ m. To obtain $Re = 20$, we can arbitrarily set μ , V and ρ . For our case, let's set $\rho = 1 \text{ kg/m}^3$, $V = 1 \text{ m/s}$ and $\mu = 0.1 \text{ kg/ms}$.

Preliminary Analysis

For $Re = 20$, we are looking at steady laminar flow. What will be the velocity profile of this flow? What will be the drag coefficient of the cylinder? What will be the pressure coefficient around cylinder? How will the streamlines around cylinder look like?

Let's start the modeling in our quest to find out the answer!

We'll create the geometry and mesh in GAMBIT which is the preprocessor for FLUENT, and then read the mesh into FLUENT and solve for the flow solution.

[Go to Step 1: Create Geometry in GAMBIT](#)

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