

# FLUENT - Compressible Flow in a Nozzle- Step 5

Author: Rajesh Bhaskaran & Yong Sheng Khoo, Cornell University

Problem Specification

1. Pre-Analysis & Start-up

2. Geometry

3. Mesh

4. Setup (Physics)

**5. Solution**

6. Results

7. Verification & Validation

Problem 1

Problem 2

## Step 5: Solution



### Useful Information

These instructions are for FLUENT 6.3.26. [Click here](#) for instructions for FLUENT 12.

Now we will set the solve settings for this problem and then iterate through and actually solve it.

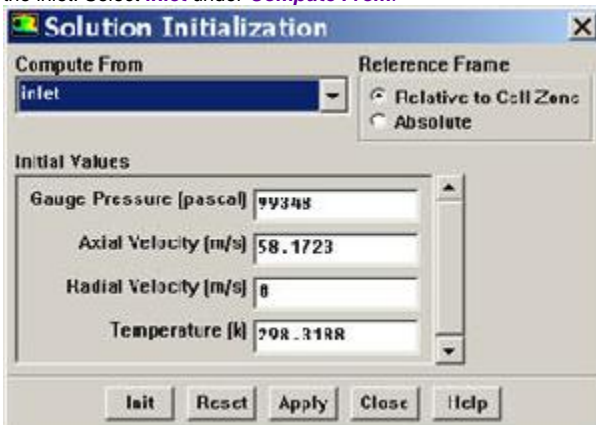
**Solve > Control > Solution**

We'll just use the defaults. Note that a second-order discretization scheme will be used. Click **OK**.

### Set Initial Guess

**Main Menu > Solve > Initialize > Initialize...**

As you may recall from the previous tutorials, this is where we set the initial guess values for the iterative solution. We'll set these values to be the ones at the inlet. Select **inlet** under **Compute From**.



Click **Init**. The above values of pressure, velocity and temperature are now assigned to each cell in the grid. This completes the initialization. **Close** the window.

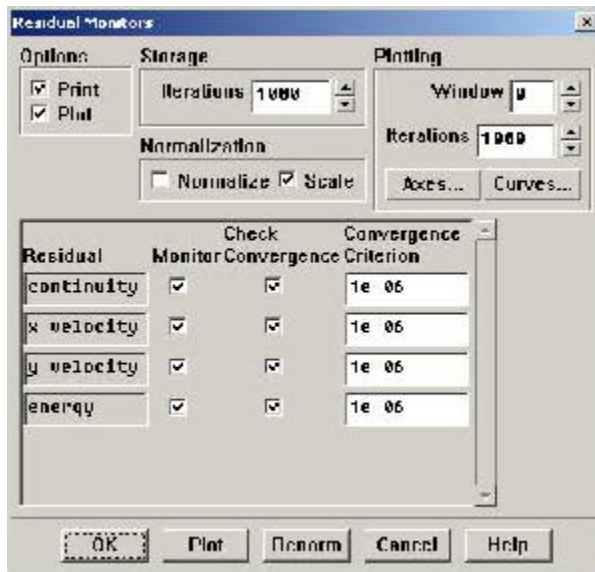
### Set Convergence Criteria

FLUENT reports a residual for each governing equation being solved. The residual is a measure of how well the current solution satisfies the discrete form of each governing equation. We'll iterate the solution until the residual for each equation falls below  $1e-6$ .

**Main Menu > Solve > Monitors > Residual...**

Change the residual under **Convergence Criterion** for **continuity**, **x-velocity**, **y-velocity** and **energy** to  $1e-6$ .

Also, under **Options**, select **Plot**. This will plot the residuals in the graphics window as they are calculated.



Click **OK**.

## Iterate Until Convergence

Main Menu > Solve > Iterate...

In the *Iterate Window* that comes up, change the **Number of Iterations** to 500. Click **Iterate**.

The residuals for each iteration is printed out as well as plotted in the graphics window as they are calculated.

Save case and data after you have obtained a converged solution.

Go to [Step 6: Results](#)

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