

Computational Analysis on Flow with Various Discharge

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Abstract— The computational analysis of flow properties on venturi of their various nozzle angles are 32°, 34° and 38°, 42° respectively. The numerical and flow properties analysis had done to investigate pressure inside venturi as well as velocity and mixing properties of air-fuel ratio to get better atomization properties and thermal, mechanical efficiency. To increase volumetric efficiency of engine, improve design of venturi so we took mentioned angle that to do investigate as cfd analysis to improve its flow properties as well as mixing properties.

Keywords: venturi, investigates flow properties on venturi

I. INTRODUCTION

CFD analysis on venturi for C-D types nozzle angle are 32°, 34° and 38°, 42° respectively, so we can do investigate their different flow properties. Cfd process done in CFX software in Ansys so we go for analysis to get acquire result.

II. GEOMETRIC PARAMETER

Geometric dimension of the Carburetor:

Following parameters for design taken below mentioned:-

Total length of carburetor = 130 mm

Inlet diameter = 45 mm

Throat diameter = 30 mm

Outlet diameter = 40 mm

Length of throat = 7 mm

Length of the inlet part = 50 mm

Length of the outlet part = 50 mm

Nozzle inlet diameter = 7 mm

Angle of fuel discharge nozzle with the vertical axis of carburetor = Θ

III. FLOW CONDITION & ASSUMPTIONS AND BOUNDARY CONDITIONS

A. At Inlet

Condition	Values
Temperature	296k
Pressure	1 bar
Velocity	40 m/s
Turbulent Intensity	10%
Wall condition	No slip
Flow Direction	Normal to boundary

B. At Outlet

Condition	Values
Temperature	296k
Pressure	0.9 bar
Wall roughness	smooth
Turbulent Intensity	15%

Table 1: Boundary condition for inlet and outlet

IV. MODELING OF GEOMETRY

In geometry modeling, we shall see about geometry analysis of Venturi design

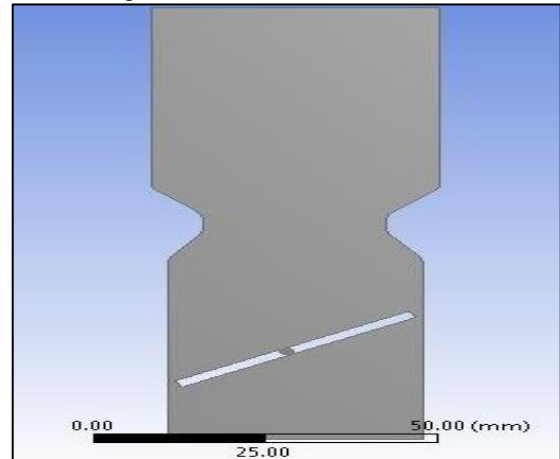


Fig. 1: Plane view of Import geometry in ANSYS

V. MESHING DETAIL OF GEOMETRY

In meshing part, as mentioned above and shown geometry like 32°, 34°, 38° and 42° are each meshed as structured Quadrilateral mesh shaped for discharge nozzle angle of venturi of carburetor. So figure of meshing sample as below as follows.

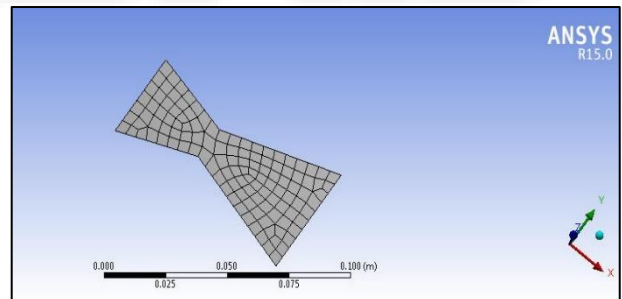


Fig. 2: Mesh geometry

Element type	Quadrilateral
Number of nodes	45680
Number of elements	45180
Refinement	Up to 3 degree

Table 2: Meshing details of venturi passage

VI. CONCLUSION

Flow analysis of mentioned angles are verified.

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