

# Aerodynamic Study On Symmetrical Airfoil For Different Chord Length

## Abstract

In this study conducted in Open foam software. In symmetrical airfoil the upper and lower shapes are same. This study includes all the data regarding airfoil. Maximum thickness is maintained at 12% of chord length. Drag force and drag coefficients are derived for various chord length. The chord lengths are 0.5m, 0.6m and 0.75m and angle of attack is maintained at zero degree. In this study only focus on drag. Because, there is no lift forces are created for symmetrical airfoil at the angle of attack is zero. So, the total aerodynamic force is equal to the drag force at zero angle of attack of symmetrical airfoil.

## Problem Statement

CFD study on symmetrical Airfoil. Estimating drag force and drag coefficient for various chord length and maximum thickness using Open foam software. That the coefficient of drag is also calculated analytically. Study of pressure over the airfoil also performed.

## Initial Data

Angle of attack: 0

Solver Type: Simple Foam

Inlet Velocity: 100m/s

Mach Number: 0.3

Chord Length: 0.5m, 0.6m and 0.75m

Maximum Thickness: 12% of Chord Length

Density of Air:  $1.225\text{kg/m}^3$

Kinematic Viscosity of Air:  $1.48 \times 10^{-5} \text{ m}^2/\text{s}$

In the following fig shows the air flow direction.

