Date: 28/08/2022

NAVTTC Batch-III

DHA SUFFA UNIVERSITY

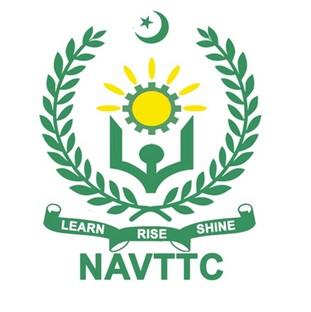
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STUDENT

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CNIC #42301-8153517-9

# ANSYS AIRFOIL CFD

ASSIGNMENT # 2 REPORT

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Description of task Geometry Preparation Mesh generation

Brief description of all selected assumptions and models for the simulation in Ansys Fluent

presentation and interpretation of result

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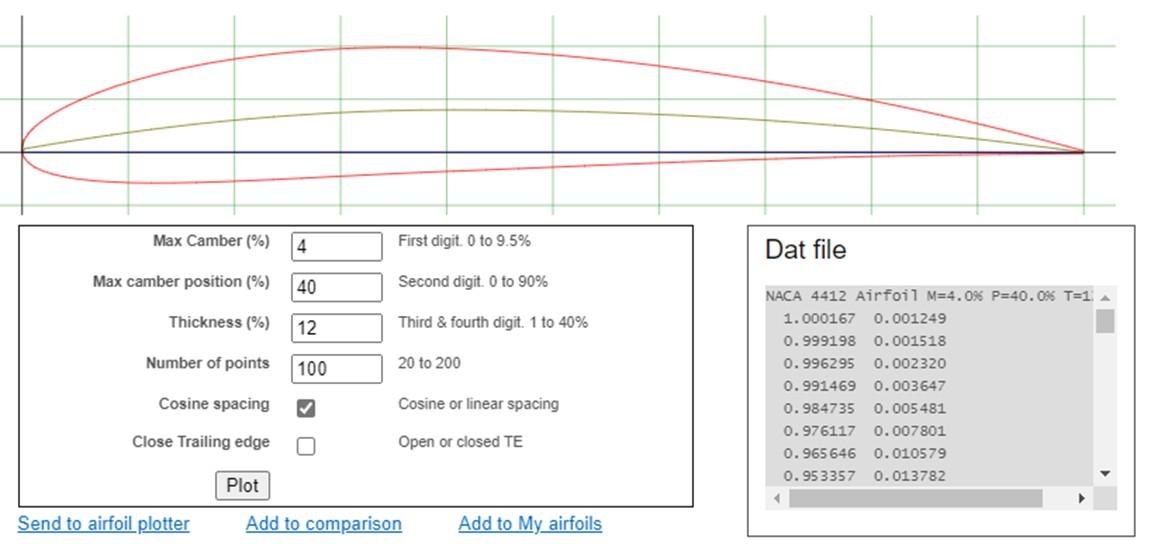
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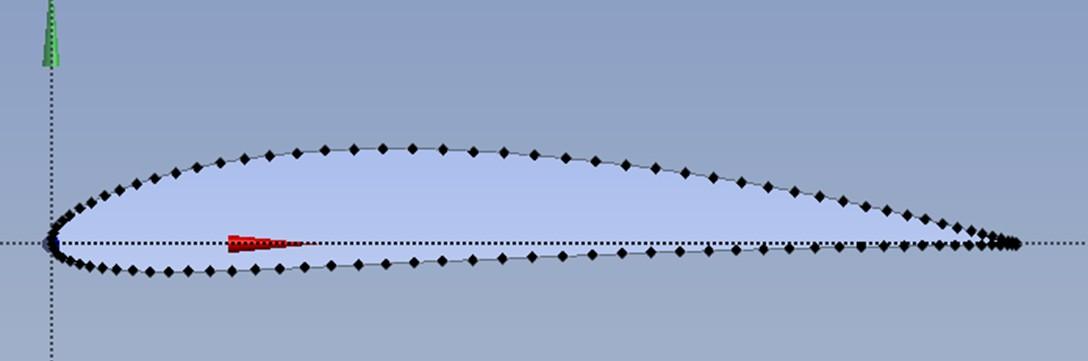
2 Geometry Preparation

NACCA Airfoil 4412

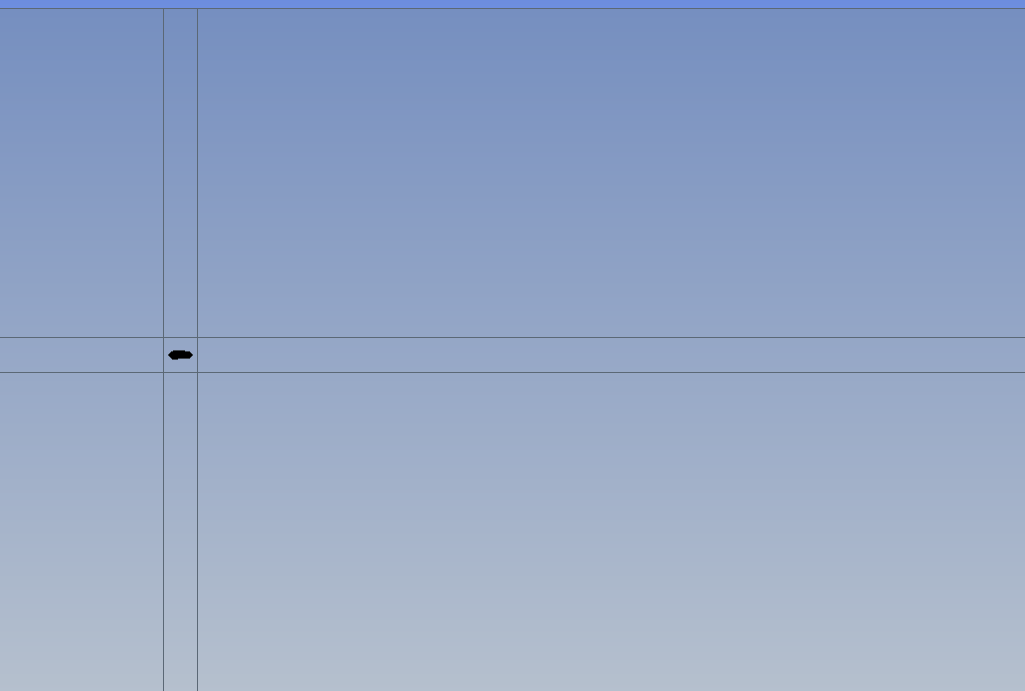


Downloaded data file of NACCA Airfoil 4412 from airfoil tool website

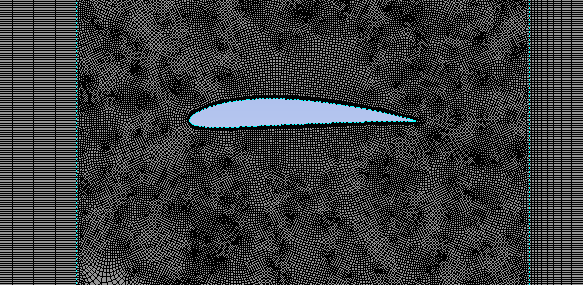
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Domain prepared in Design Modeler

### Dimensions of Domain

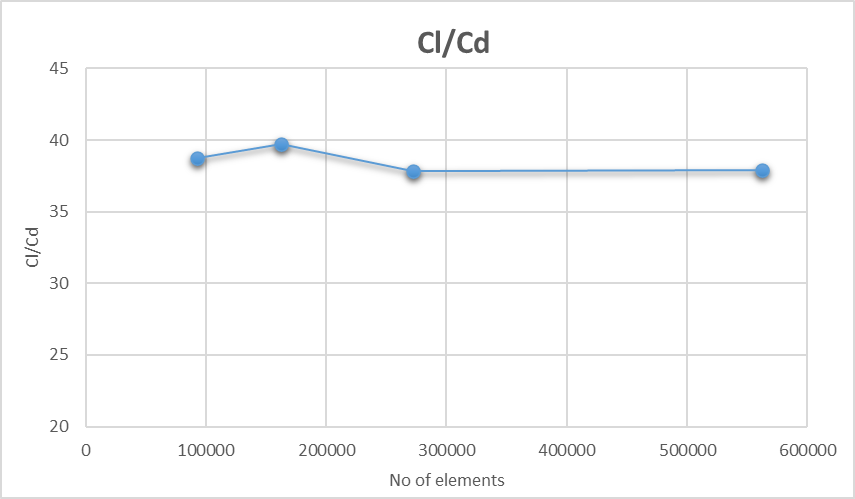
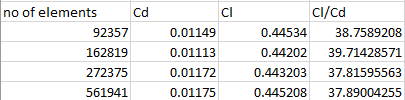
Vertical dimensions = 40000mm airfoil is at mid

Horizontal dimensions = 60000mm airfoil is 50000mm from right side.

2 Mesh generation

## 6

**Mesh Independence**

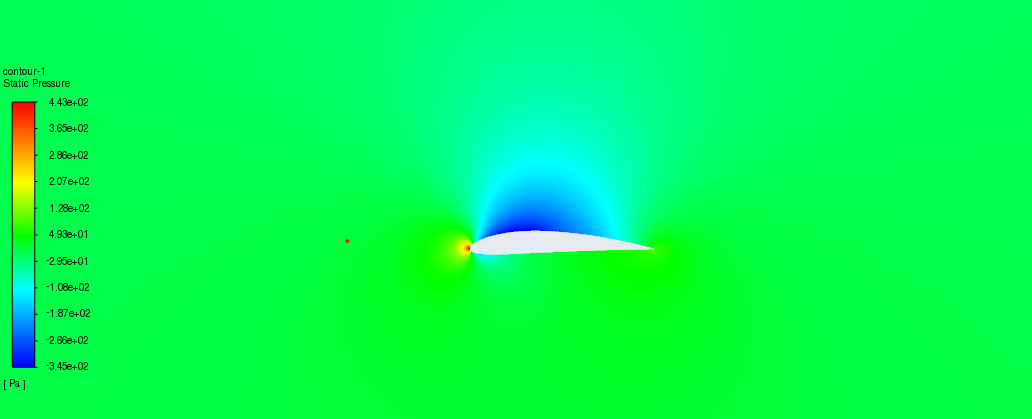
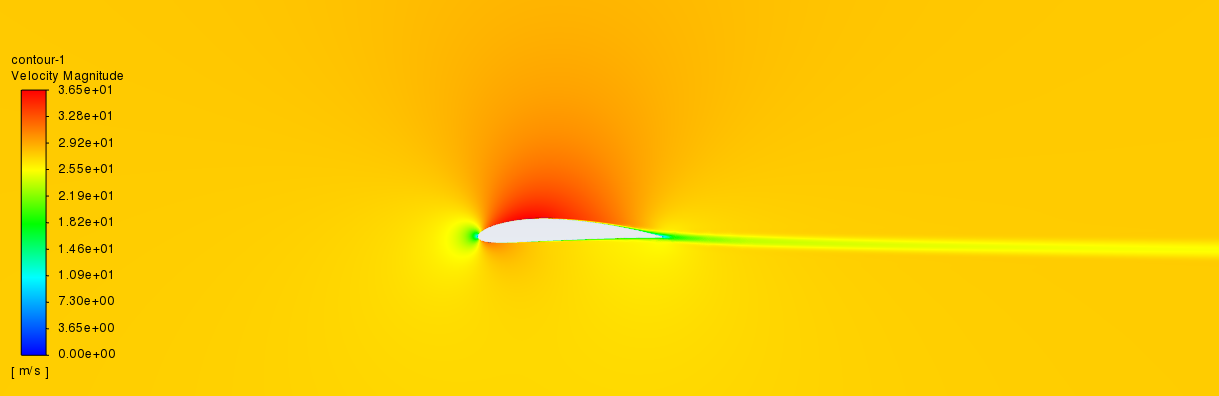
Table showing mesh independence:

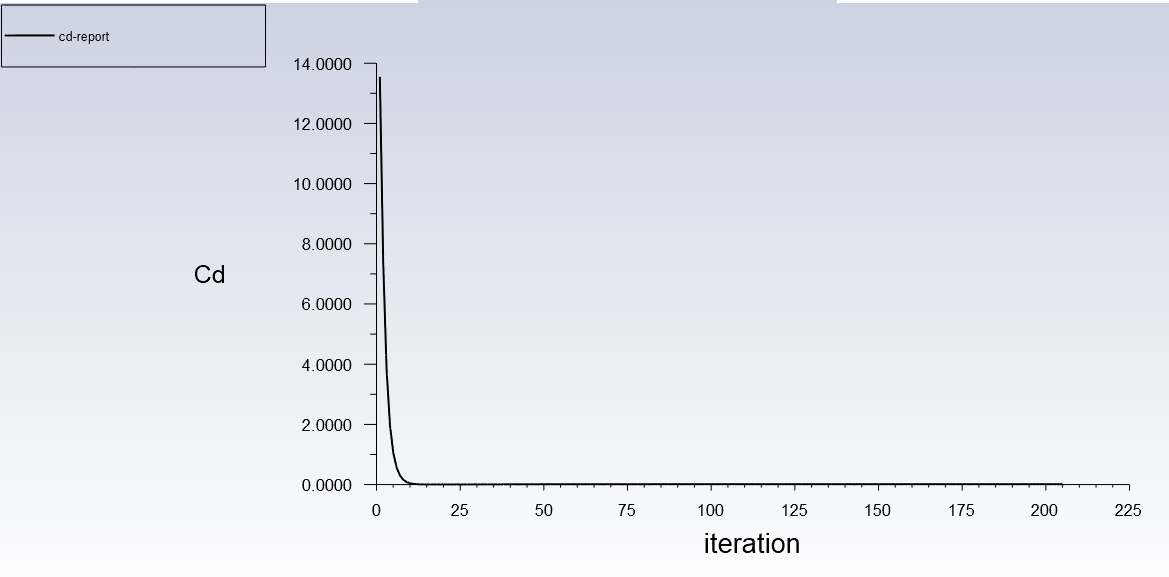
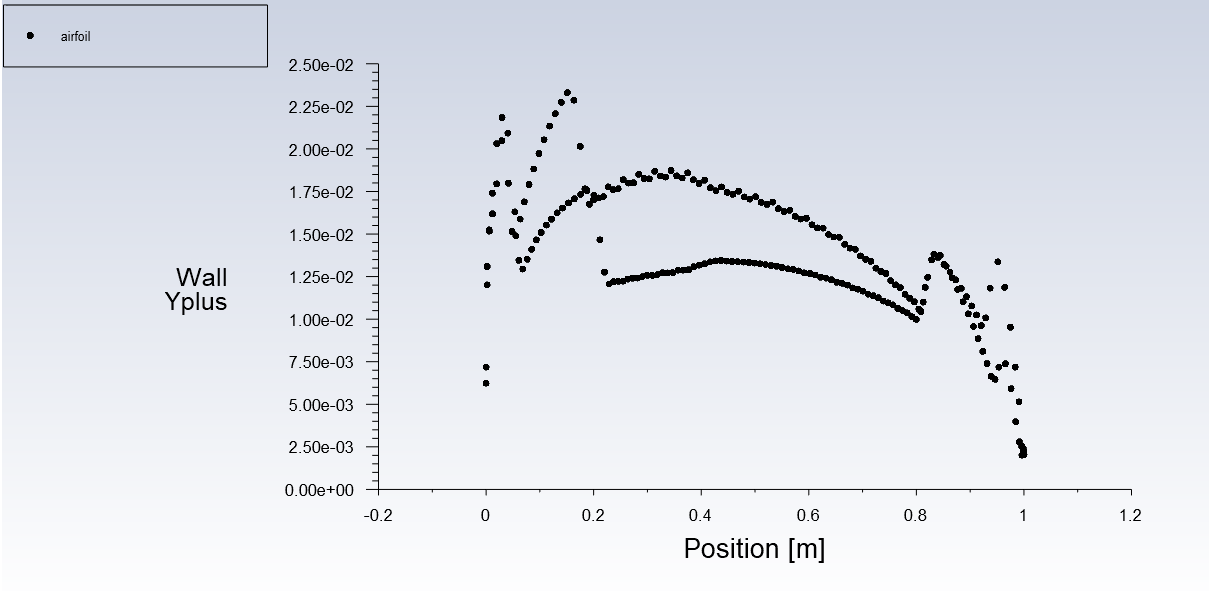
Graph of table: Cl/Cd vs No. of elements

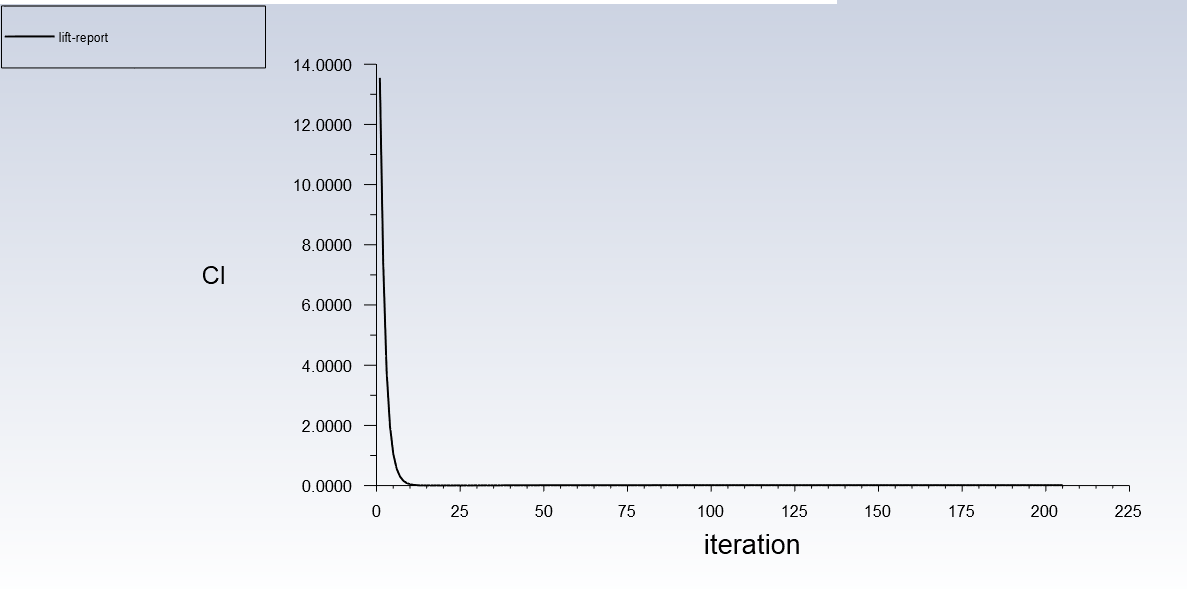
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Results for 0°angle of attacks.

Velocity contour Pressure contour

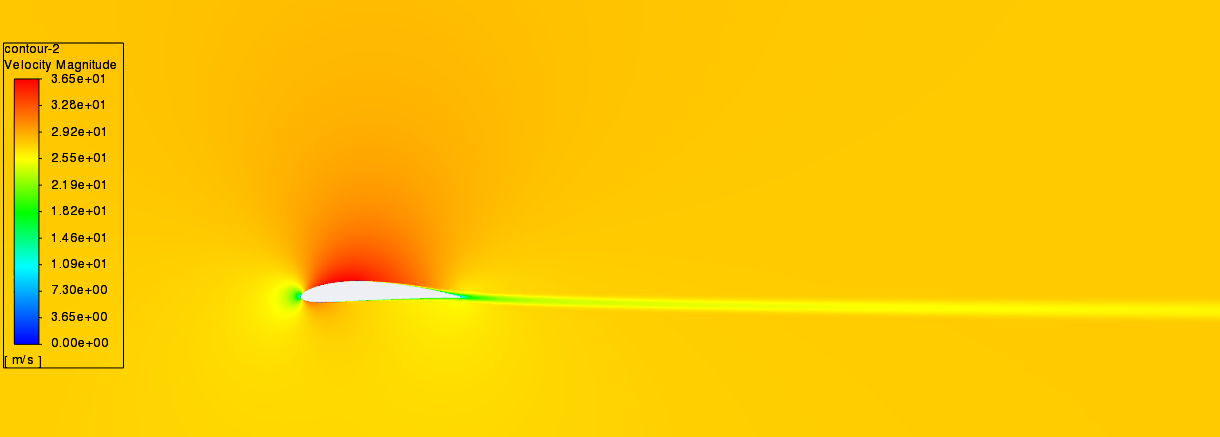
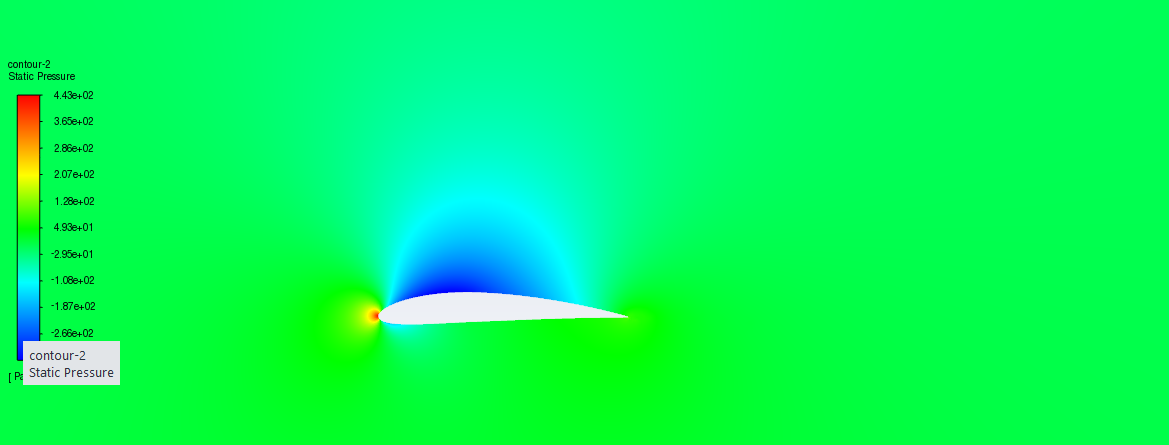


Wall Yplus plot Cl and Cd plot

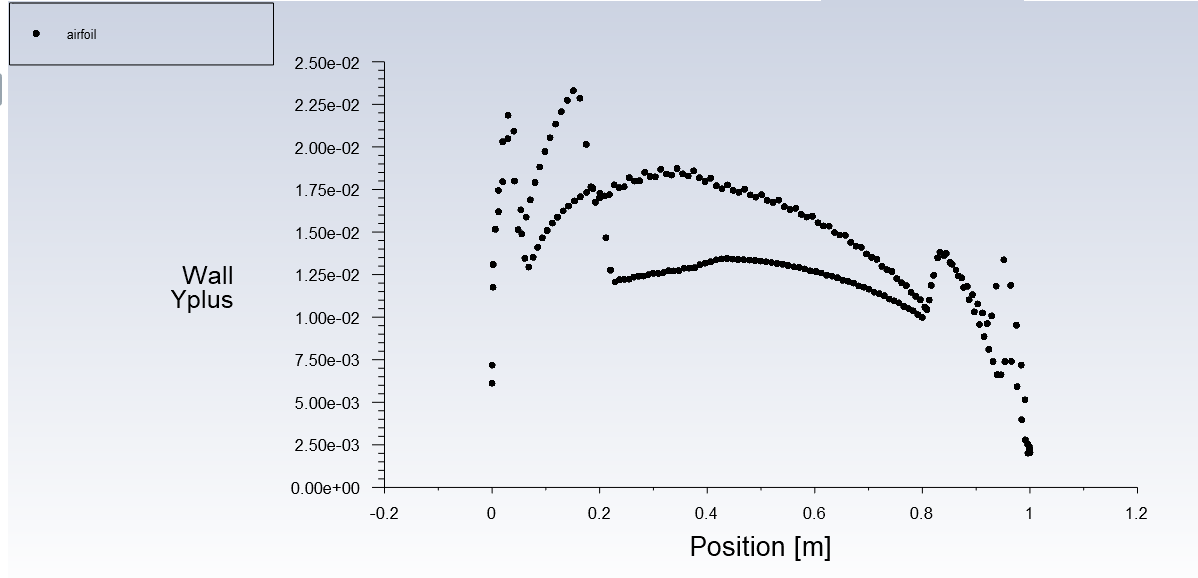
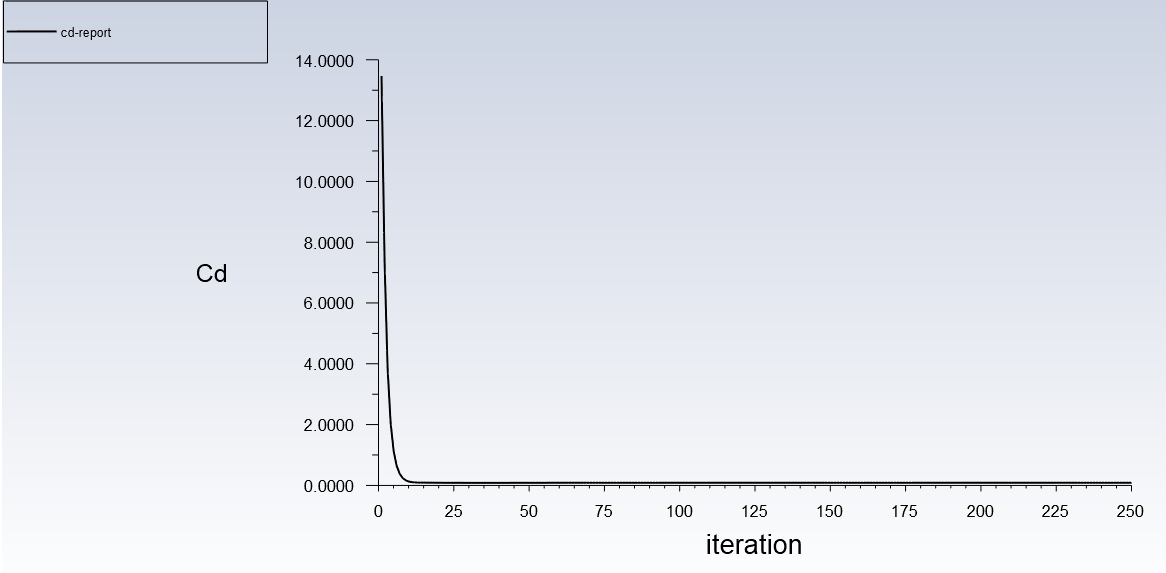
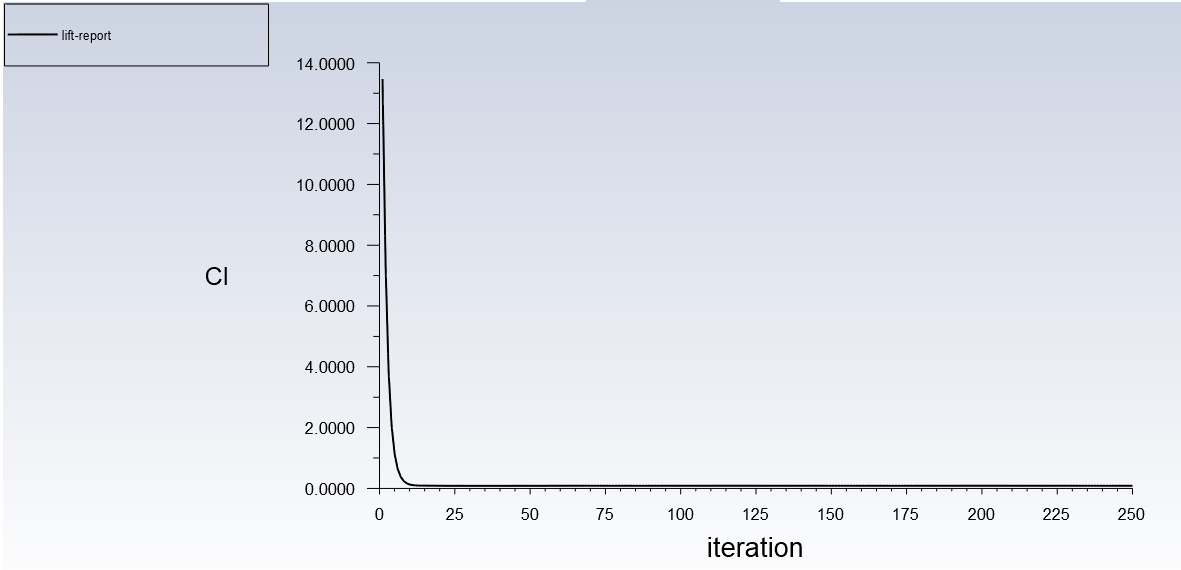


Results for 10°angle of attacks.

Velocity contour Pressure contour

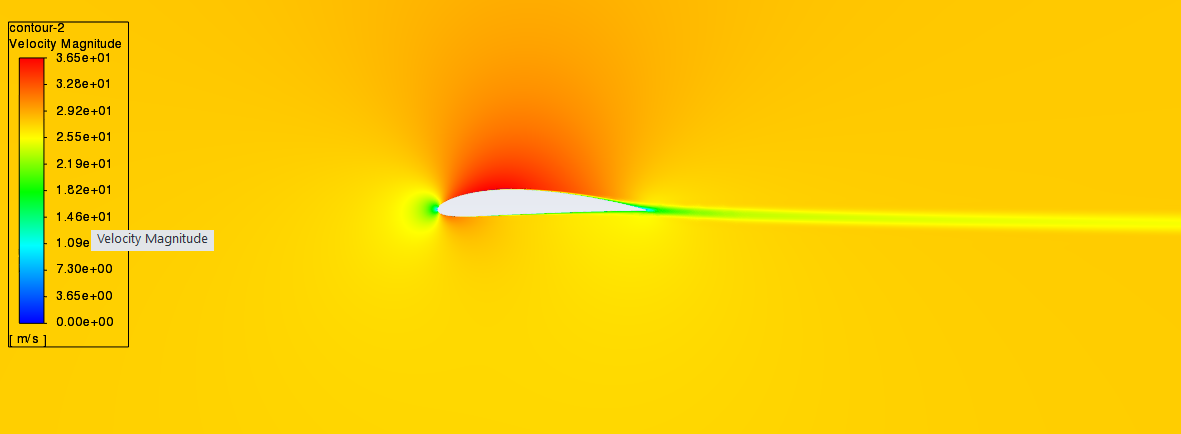
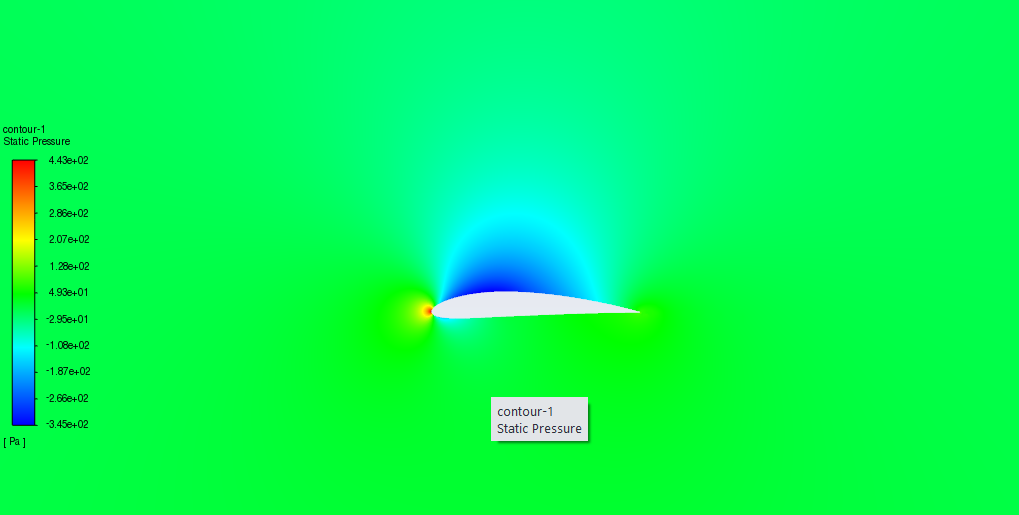


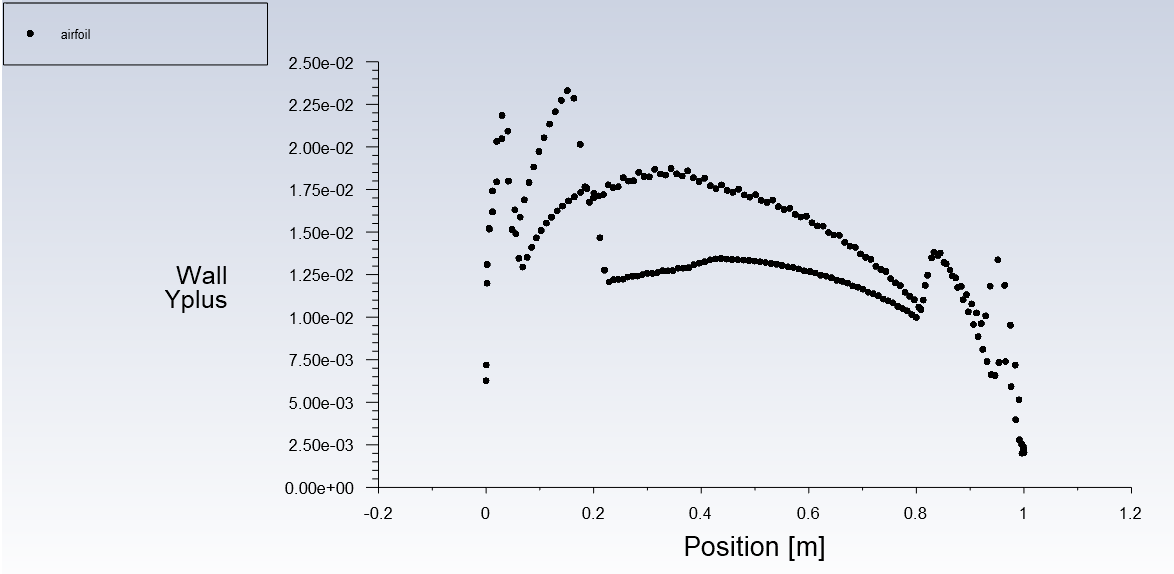
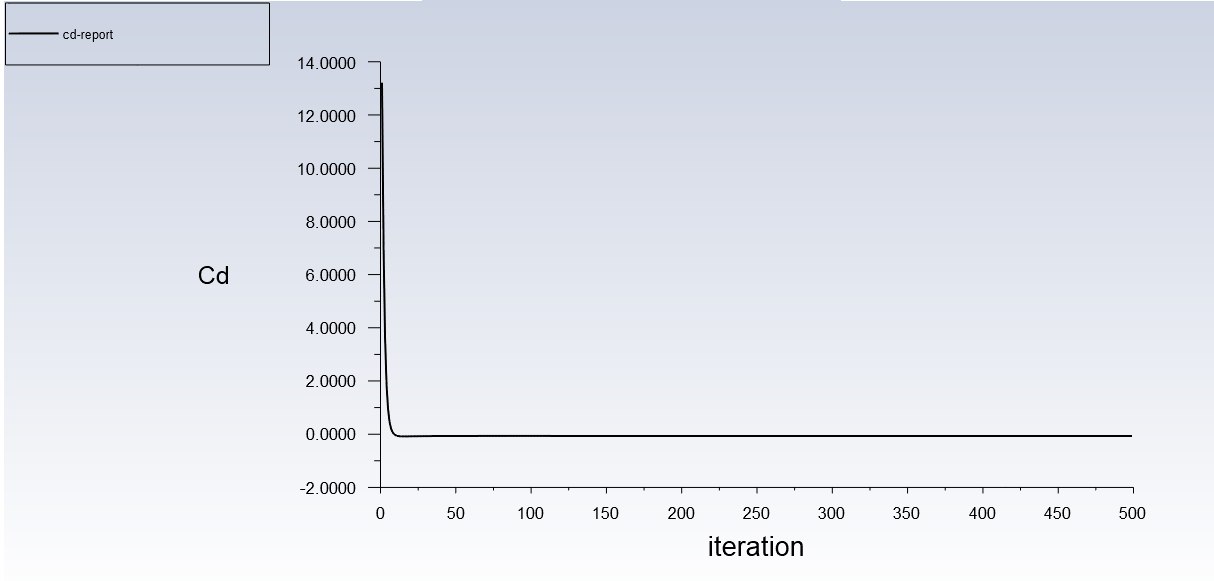
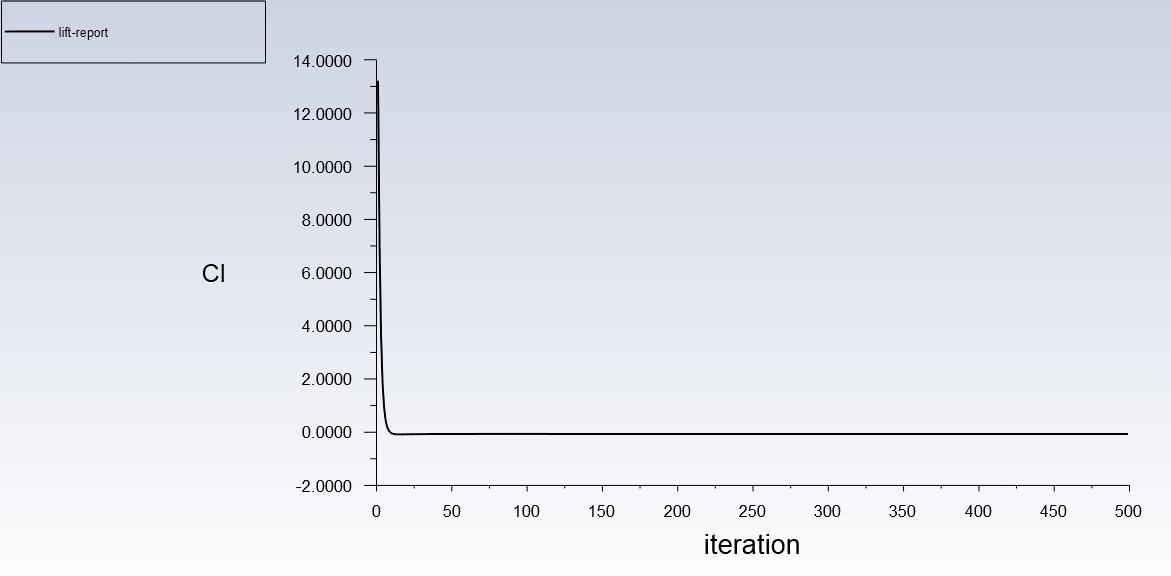
Wall Yplus plot Cl and Cd plot



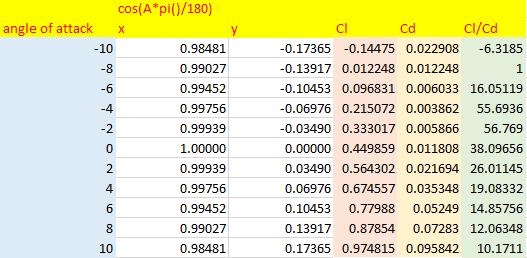
Results for -10°angle of attacks.

Velocity contour Pressure contour



Wall Yplus plot Cl and Cd plot

Computed values of Cl, Cd and Cl/Cd in a table Graph of Cl vs Cd



Graph of Cl vs Angle of Attack Graph of Cd vs Angle of Attack

Graph of Cl/Cd vs Angle of Attack