# Min Project on ANSYS ICEMCFD

# Geometry creation for 3D missile geometry


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This mini project deals with the geometry creation for 3D missile geometry. This is an extension of previous mini project “Geometry creation for 2D missile geometry”. In this project, you are supposed to create 3D geometry and external domain for CFD analysis. This mini project tests your understanding of various geometry creation options available in ANSYS ICEMCFD. After completing this mini project you will be comfortable in geometry creation/repair operations for simple geometries.

## 1 Prerequisites

Before starting this project, it is expected that you have worked on previous project “Geometry creation for 2D missile geometry”. The main pre-requisite for this assignment is basic understanding of geometry creation available in ANSYS ICEMCFD. Before taking this assignment, please make sure that you have gone through necessary lessons. The functionalities you need to use to complete this test are well explained in lessons “Geometry creation in ANSYS ICEMCFD”.

## 2 Problem Definition

Missile geometry given in this problem is typical missile geometry used in aerospace industry. The objective of this assignment is to create 3D missile geometry using ANSYS ICEMCFD. The geometry is to be generated to carryout external flow CFD simulation. The end result of this project is shown in figure Figure 1.

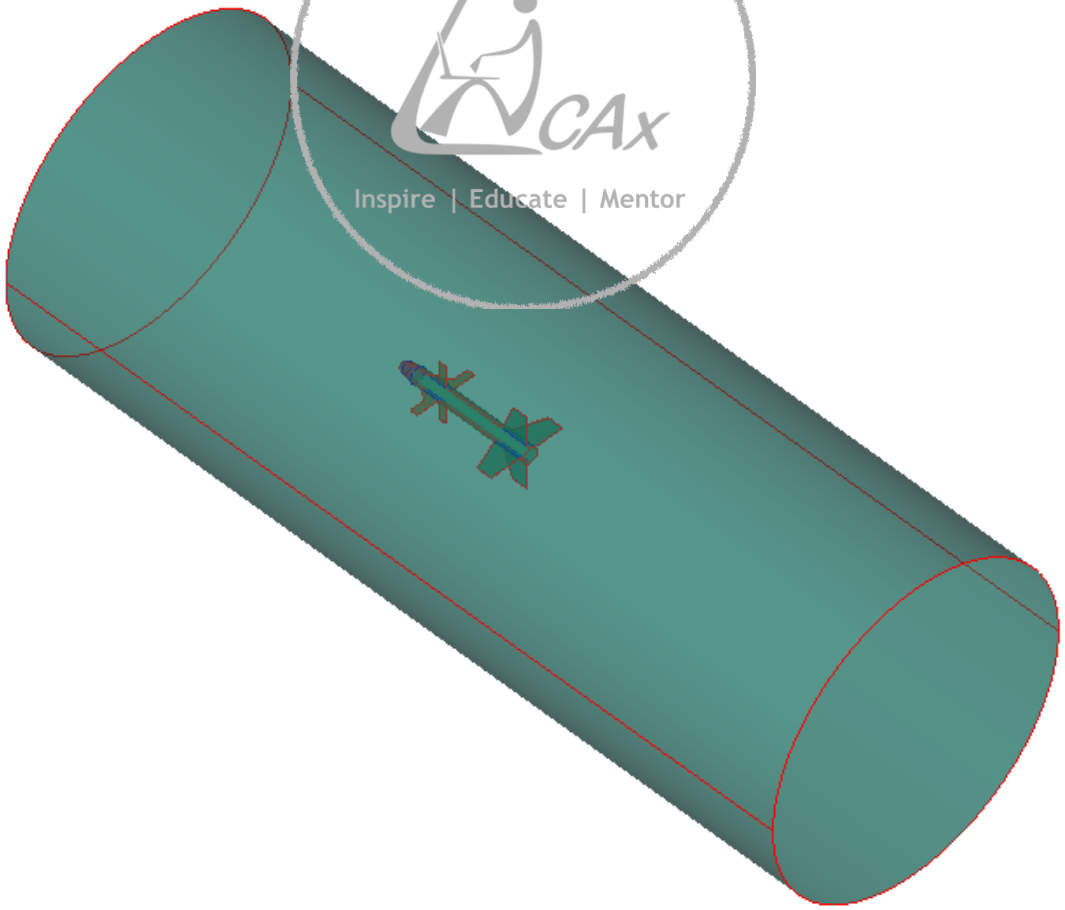



Figure 1: 3D CFD domain for external flow analysis

All geometry dimensions of missile are given in Figure 2. These dimensions are same as what are used in previous project “Geometry creation for 2D missile geometry”. So you can use that geometry file to start with. In case if you have not worked on previous project, 2D geometry file is provided as input for this project. (It is strongly recommended that you first work on 2D version of this project as that would give you good head-start for this project)

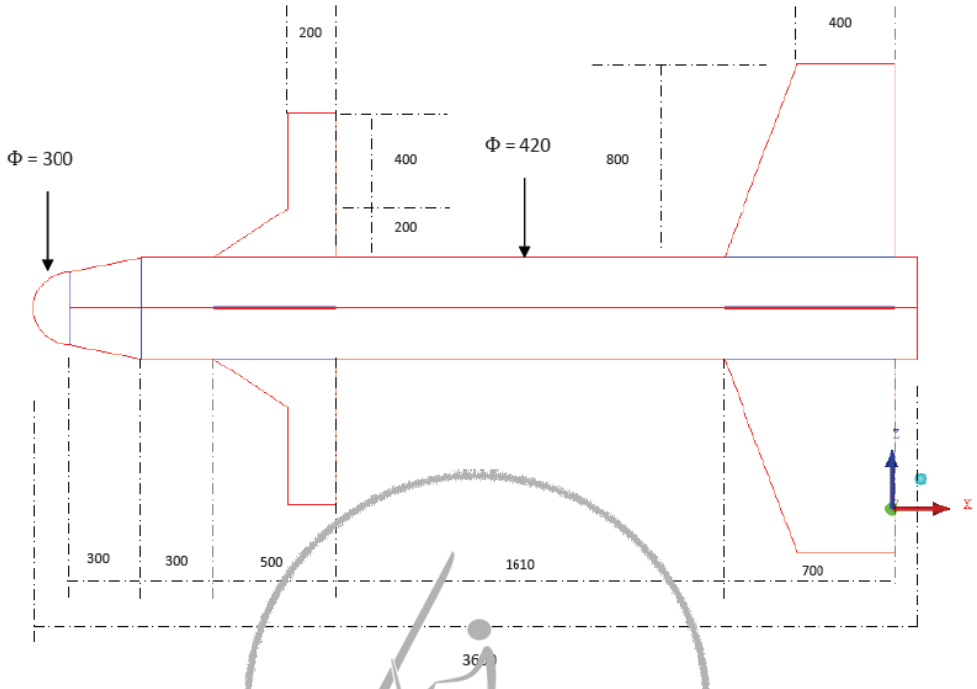



Figure 2: Geometry details (Note: All dimensions are in mm.)

There are four front fins and four back fins. All the fins has 5 mm thickness as shown in Figure 3.

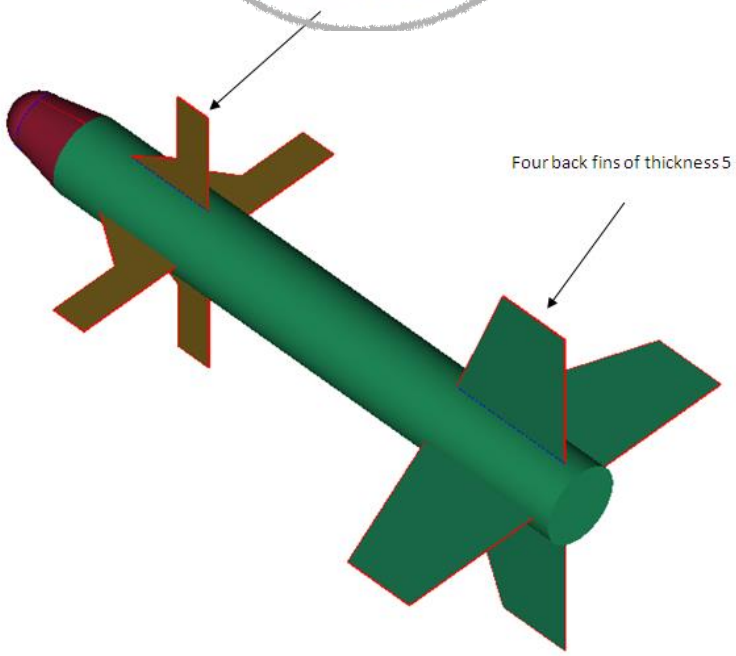



Figure 3: Fin thickness

CFD domain needs to be created around the missile geometry for external flow simulation. All the details of external domain size are shown in Figure 4.

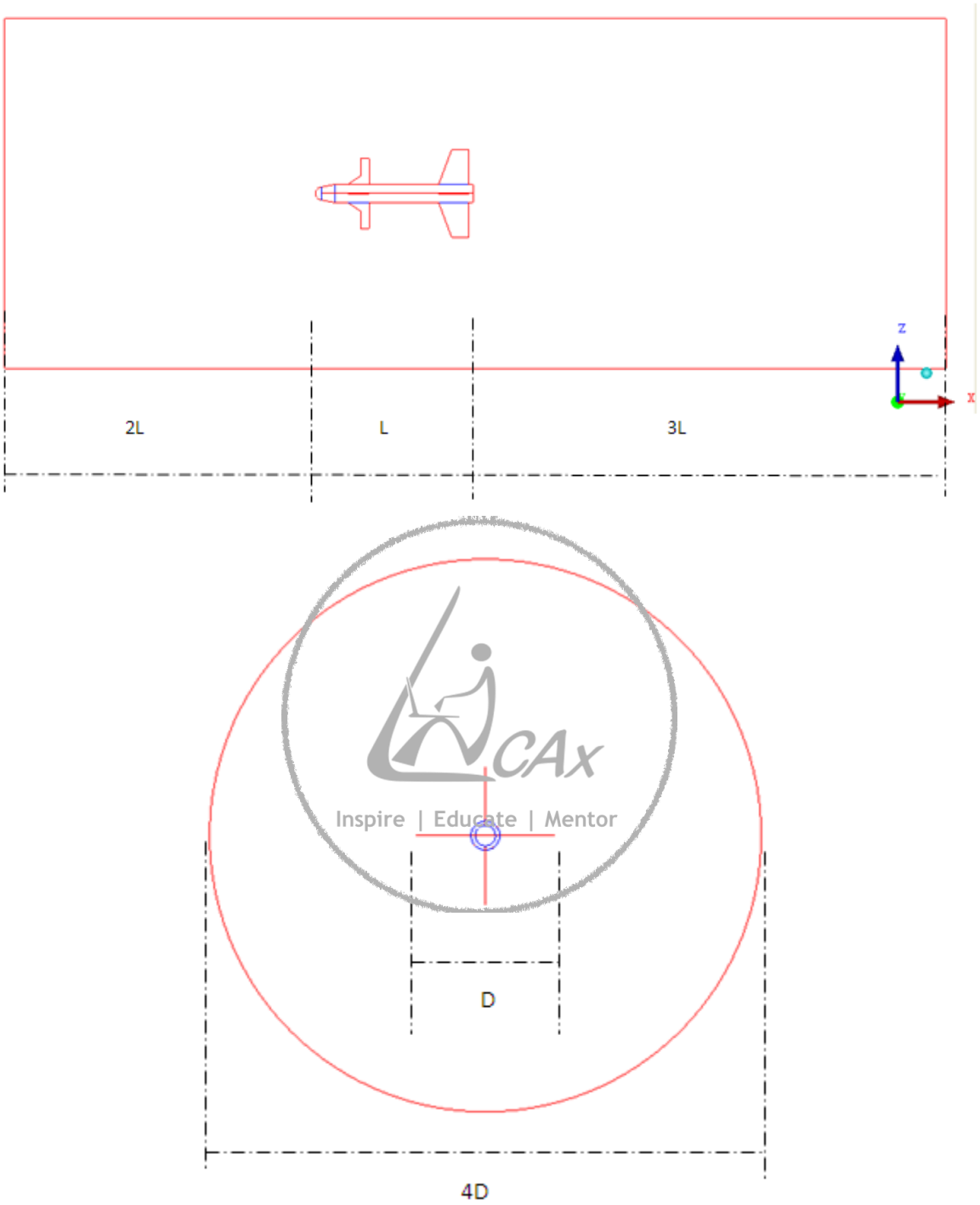



Figure 4: External domain dimensions

Once the missile and external domain geometry is created, you need to create following parts to assign boundary conditions:

- Inlet
- Outlet
- Tunnel walls

- Missile walls
- Font fins
- Back fins

## 3 Download Input Files

This mini project does not require any input files as such. Use geometry dimensions given above to create the geometry. In case if you have not worked on 2D version of this project "Geometry creation for 2D missile geometry", we have provided 2D missile geometry as input. You can download 2D version geometry as well as the PDF copy with details of this mini project from link below. Its compressed zip files, so download and unzip the file to get PDF copy.

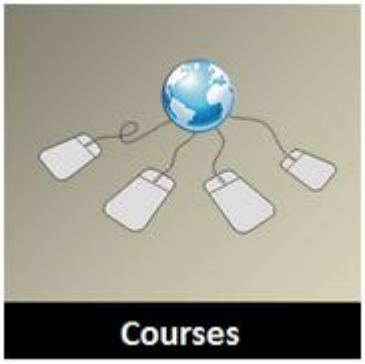
1. PDF instructions for this mini project
2. 2D missile geometry

You can also these files from "Shared Files" section on lesson page.

## 4 Results and Discussion

If you have any specific query about the mini project or want to share the results of this project, please post them on course discussion forum.

## LearnCAx knowledge Base

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