# AE 771 Injector Design

**Due: Friday April 9th, 2020**

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**Project Objectives**

1. Provide a table of your calculated and assumed values.
2. Provide images of the CAD model. Please dimension your CAD images.

**Code and Workflow**

https://github.com/Drifterino/AE-771/blob/master/Injector%20Design.ipynb

**Assumed and Characteristic Values**

| Symbol | Value | Variable | Units |
|---|---|---|---|
| Mdoto_A | 8.411 | Actual Oxidizer Mass Flowrate | kg/sec |
| Mdotf_A | 2.471 | Actual Fuel Mass Flowrate | Kg/sec |
| ρo | 11168.9 | Liquid Weight Density of Oxygen (Oxidizer) | N/m^3 |
| ρf | 691.2 | Liquid Weight Density of Hydrogen (Fuel) | N/m^3 |
| P1 | 6894750 | Chamber Pressure | Pa |
| ΔP | 1378950 | Change in Pressure | Pa |
| Cd | 0.9 | Discharge Coefficient of Injector | ~ |
| Dc | 136.544 | Diameter of the Chamber | mm |
| Ac | 14643.266 | Area of the Chamber | mm^2 |
| HoleSize | 0.049 | Area of the Holes | mm^2 |
| θI | 25 | Injector Angle | Degrees |
| Ao | 53.251 | Required Area of Oxidizer Injector | mm^2 |
| Af | 62.891 | Required Area of Fuel Injector | mm^2 |
| A_OxyNew | 53.251 | Final Area of Oxidizer Injector | mm^2 |
| FuelArea | 62.439 | Final Area of Fuel Injector | mm^2 |
| D_OxyNew | 0.23 | Oxidizer Hole Diameter | mm |
| HoleDiam | 0.25 | Fuel Hole Diameter | mm |
| TreeSpace | 2.276 | Radial Space Between Holes | mm |

**CAD Model | Available on the GitHub as Injector.prt**