



# Building Fire Extinguisher Drone Senior Design Project 232

Team # 084

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## ELEVATOR PITCH

Our drone is tailored for rapid response and high efficiency, the drone tackles blazes in hard-to-reach places, like high-rise buildings, with precision and safety. It's designed to ensure it can operate in extreme heat and at significant heights, changing how we protect lives and property from fire's destruction

## INTRODUCTION/BACKGROUND

### Problem Statement

The project addresses the challenges in urban fire management, especially in high-rise buildings. Traditional firefighting methods struggle with modern structures, particularly in tackling blazes in skyscrapers or special environments like aircraft hangars.

### Constraints

1. Temperature Endurance
2. Operational Altitude
3. Air Pressure Tolerance
4. Water Flow Pressure

## TARGET SPECIFICATIONS

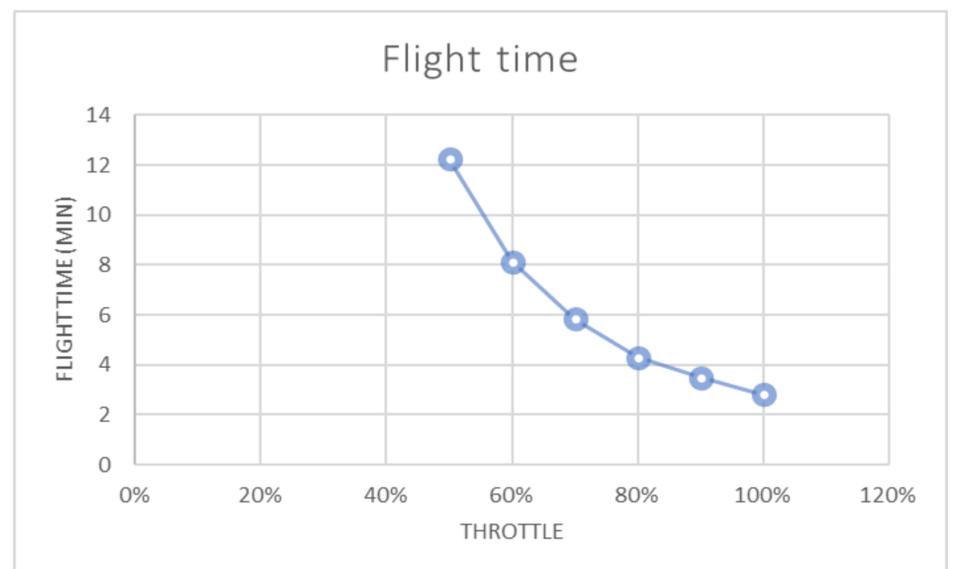
1. Flight Time => equal to 15 Min.
2. Altitude => reaching 15 meters.
3. Air Pressure Tolerance => to operate at 101.3 kPa.
4. Operational Control => up to 25 meters.
5. Temperature Endurance => up to 120°C.
6. Water Flow Velocity => out of the nozzle = 5m/s
7. Total Weight => not exceed 89 Newtons.

## PROTOTYPE DESIGN



## TESTING & VALIDATION

1. Exceeding the target specification altitude: By incorporating a specialized hose extending up to 30 meters in length.
2. We met the operational control range by using a remote control that can operate in a range reaching 1 Km
3. We met the temperature endurance limit Since the drone frame is made of carbon fiber which can resist an extremely high temperature.
4. Exceeding expectation, we achieved 5.57 m/s for the water velocity.
5. The drone weight is measured to be 79 N including the water system attached



## PROJECT IMPACT



## CONCLUSION

Our senior design project focuses on developing a firefighting drone that addresses crucial challenges in the industry. The drone's rapid response, and fire suppression capabilities will aid in mitigating risks, improving operational efficiency, and ultimately saving lives.