

# CONTROL THE EXPLOSION OF THE AIRCRAFT BY INSTALLING THE COMPARTMENT IN THE FUEL TANK WITH SPECIAL INGREDIENTS

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## Abstract

Nowadays the aircraft accidents are more prone to mechanical components failure and human error. So we need to reduce the accidents and it is necessary to enlarge the safety of the passengers. Most of the aircrafts tend to explode after it struck into an accident, so it is necessary for us to avoid explosion even when the aircraft is hit. The only way to avoid explosion is done by controlling the flashpoint and burning point of the fuel properties. So we add some additional ingredients to change the property of the fuel in order to control the burning and flash point of the aircraft easily.

**Keywords:** Aircraft fuel, fuel tank, ingredients.

## 1. Introduction

Everyone likes Aircraft journey in the world. The whole world have more interest to fly in the aircraft. There are various types of air travels. Passenger aircraft, military aircraft, cargo aircraft and space vehicles are available for the air travel. Especially passenger's aircrafts are available for commercial purpose. Every year the passenger's number is increased simultaneously. So the air travel is one of the important travels in our everyday life. So the air travel needs a safety for the passengers. If the air travel is more safety, this can increase the more travelers via air. So the aircraft companies have the responsibility to give the more safety for their passengers.



Fig 1 Aircraft view

Traditionally, the cause of an accident was often blamed on "human error". The problem is that most accidents will have a human element involved in the cause. Modern investigation techniques focus on the "How" and "Why" rather than "Who", "What" & "Where". Laying blame is completely irrelevant in the grand scheme of accident prevention for the future.

But in recent days aircraft accidents more. So it will makes the threat to the passengers about air travel. Every peoples need a peaceful travel. So we want to gave the worth travel to them. By the way due to various reasons caused the aircraft accidents. Based on the below reasons aircrafts are struck into accidents mainly..

## 1.1 Pilot Errors

- Improper procedure,
- Flying VFR into IFR conditions,
- Controlled flight into terrain,
- Descending below minima,
- Spatial disorientation,
- Premature descent,
- Excessive landing speed,
- Missed runway,
- Fuel starvation,
- Navigation error,
- Wrong runway takeoff/landing,
- Midair collision caused by pilot,
- Pilot Carelessness,
- Misleading pilot guidance.

## 1.2 Mechanical

- Engine failure,
- Equipment failure,
- Structural failure,
- Design flaw,
- Maintenance error.

## 1.3 Weather

- Severe turbulence,
- Wind shear,
- Mountain wave,
- Poor visibility,
- Heavy rain,
- Severe winds,
- Icing,
- Thunderstorms,
- Lightning strike.

## 1.4 SABOTAGE

- Hijacking,
- Shot down,
- Explosive device aboard.

## 1.5 OTHER

- ATC error,

Ground crew error,  
Overloaded,  
Improperly loaded cargo,  
Bird strike,  
Fuel contamination,  
Pilot incapacitation,  
Obstruction on runway,  
Fire/smoke in flight.

Based on the above reasons accidents occurred in the aircrafts. But mainly fuel is the responsible for aircraft explosion. So we want to avoid the explosion of the aircraft necessarily. We can follow the below method to control or avoid the explosion of the aircraft as much as possible.

The Black Box is a box which recorded the flight information's and flight parameters. Sometimes during the flight accidents it may be lost. So if we control or avoid the explosion of the aircraft, we may find the Black Box easily.

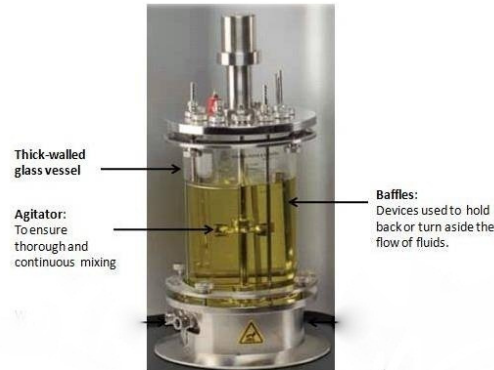
## 2. Working Procedure

When the aircraft is struck into accident by the above reasons, pilot have the one switch. Which switch is connected by the electronic actuators and sensors to the aircrafts fuel tank. The aircraft fuel tank contains the small closed chamber. The closed chamber is fitted inside the fuel tank center body. The closed chamber also contains the some of one ingredients. Whose ingredients can change the property of the fuel is stored inside that closed chamber. After adding the ingredient to the aircraft fuel, then it can change the fuel properties into non volatile nature. Which means the aircraft fuel does not have burning properties. The aircrafts fuel burning point and flash point can be controlled by the ingredient. After changing the property of fuel aircraft may touch down the land or water. Then the aircraft does not explode. Because that aircraft doesn't have burning characteristics in that fuel tank. So we can easily guarantee the life of the passengers.

## 3. Working Methodology

The adding of ingredient is main event in this process. Because we add and mix the ingredient in very short period of time after the pilot knows the aircrafts goes to accidental stage. We use two types of methods to execute this process. First one is Distribution and the second one is Dispersion method.

Distribution is a method which involves to distribute the ingredient to all that 360 degree direction by the sprinkled method. then the ingredient flows over the all direction equally.



This is a example of agitator mix of fuel and ingredient process

Fig 2 Model for agitator inside the fuel tank.

Usually at the high speed of aircraft fuel also slosh at the both edges of the fuel tanks .so it gives us to mix the fuel with ingredient is very easy. But also used dispersion method to spread over the ingredient widely by the agitator. The agitator is fitted on the top and bottom of the closed chamber inside the main fuel tank. We can fix this arrangement to the all compartments of fuel tanks. The size of closed chamber depends upon the availability or volume of fuel tank.

## 3.1 Fuel Tank Arrangements

Basic layout of fuel tanks in a large civil aircraft as shown in figure.3. The tanks would be subdivided in both side of wings and center of the fuselage body. so the fuel tank have more space, so we can placed our closed chamber inside that fuel tank.

Some types of aircraft have extra tanks distributed in different layouts, so that weight distribution and balance can be maintained. The following image shows a military tanker aircraft that can deliver fuel to other planes in flight.

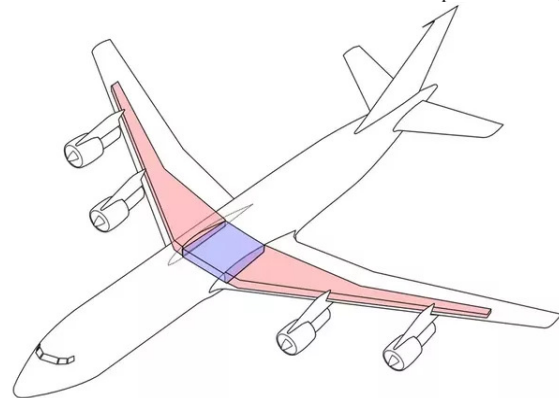


Fig 3 Fuel tank locations in the Aircraft

First thing is wings are integral part of Aircraft. It cannot be eliminated. So we are very eager to use the wing cross sectional area as efficient as much as possible.

1. Fuel is not stored throughout the wing, it is mostly stored both the side near the fuselage and leading edge where the wing looks little bulkier.

2.All the fuel tanks are inter connected(through weight balancing electrical circuit) as center of gravity should

not

change.

3. As you said of course wings are subjected to bending moment caused by lift and other related forces. But the places where fuel stored will be designed such a way that experiences the lesser bending moment.

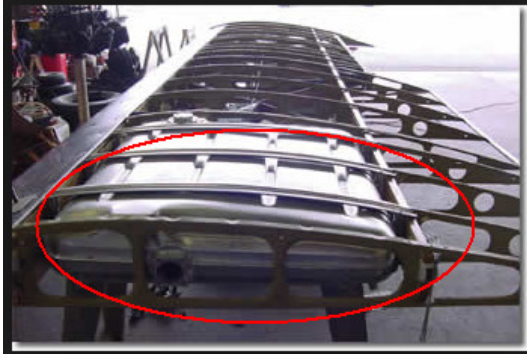


Fig 4 Cross section of Fuel tank.

#### 4. Conclusion

Thus the fuel properties can be changed into non volatile fuel properties by adding our ingredient. Thus ingredient we can use any type of aircrafts to avoid the explosion to enlarge the passengers safety. In passengers, Cargo, Fighters and Space vehicles we can use this method to avoid the explosion. This method is low cost and less maintenance.

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