

# MICROPACK

## FIRE & GAS

*A Consilium Group Company*



# Intelligent Visual Flame Detection for Aircraft Hangars

Aircraft hangars must have rapid flame detection systems in place. But current fire safety systems cause frequent false alarms.

Discover the benefits of IVFDs

# Intelligent Visual Flame Detection

Given the valuable nature of the aircraft they house, hangars must have rapid flame detection systems in place, but with a highly responsive fire safety system comes the problem of frequent false alarms.

Currently, the use of traditional heat and Optical Flame Detectors in aircraft hangers is wide-spread.

To reduce the risk of costly false alarms, a better system is needed.

In what follows, we make the case for Intelligent Visual Fire Detectors (IVFDs) with 3D hazard mapping, which can quickly and accurately identify aircraft hangar fires.

## The importance of fire safety in aircraft hangars

Aircraft hangars are themselves valuable: a high-spec hangar alone could set you back \$3m.

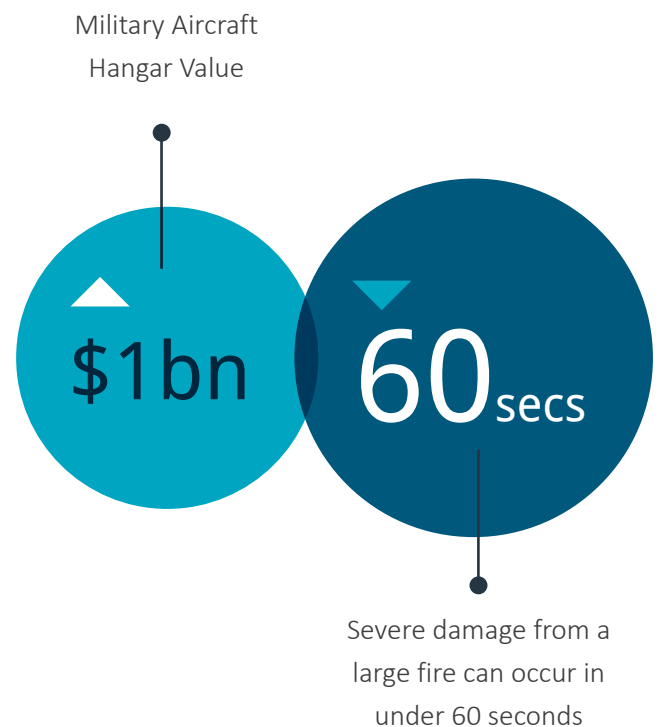
But that pales in comparison to the value of the items inside. A civilian aircraft like the Airbus A380 costs over \$430m, while the cost of a US military aircraft can reach \$1B.

Clearly then, the importance of securing a hangar against fire related accidents that could damage its contents is paramount.

That's easier said than done. Aircraft hangars are also a hotbed for fire hazards. The presence of jet fuel and other hydrocarbons, refueling and moving aircraft all pose a dangerous risk.

Severe damage to an aircraft from a large fire can occur within under a minute, but expansion foam can take longer than two minutes to sufficiently fill the hangar and suffocate fire at the top of a small aircraft.

That's why identifying fires as soon as they start is critical.



# Optical flame detection in hangars



Optical Flame Detectors are well suited to aircraft hangars' unique conditions and are therefore widely used. Detectors of this kind have wide fields of vision, allowing them to detect flames from a distance of over 40 m.

That's ideal when you consider hangars' high ceilings, where identifying a fire on the ground from a long distance could otherwise be difficult. High ceilings also pose a risk of thermal stratification, which can often thwart heat detectors' ability to identify fires.

An additional benefit of Optical Flame Detectors is their capacity to recognise fires faster than smoke or heat detectors can: usually in under 10 seconds of a small fire breaking out.

But while they have many benefits, traditional Optical Flame Detectors like multi spectrum infrared detectors (MSIRs) have certain key flaws, mainly related to false alarms.

## The issue of false alarms

The risks associated with traditional Optical Flame Detectors demonstrate the need for a more effective detection system with a lower risk of activation caused by false alarms.

### CO<sub>2</sub>

Traditional Optical Flame Detectors like MSIRs and IR3s identify flames by responding to the presence of hot CO<sub>2</sub> in the air.

But in an aircraft hangar setting, where jet engines and motors are in frequent use, this is hardly an ideal detection method.

### Sunlight Desensitisation

While sunlight won't generally trigger false alarms in Optical Flame Detectors, it might impair them, as they can become desensitised when exposed to too much sunlight.

That's a big problem in hangars, whose wide doors are often kept open during the day to facilitate the moving and maintenance of aircraft.

# Intelligent Visual Flame Detectors

Intelligent Visual Flame Detectors (IVFDs) are an excellent alternative to traditional optical detectors. While false alarms are still possible when IVFDs are in place, the risk is significantly lower.

IVFDs use a camera and onboard mechanism to spatially analyse video for fire. Remote viewing options allow operative personnel to visually confirm a fire in the event of an alarm warning or activation of an automatic suppression system, meaning they can quickly react and, if necessary, override the response.

IVFDs cannot identify CO<sub>2</sub> emissions, so an alarm won't be triggered because of exhaust fumes from jet engines or diesel generators during routine activities including aircraft maintenance. This fact alone makes a good case for the adoption of IVFDs in air hangars, as they are better suited to the context.



## Recording incidents with IVFDs

Some IVFDs have the ability to record alarm-triggering events. This is a valuable asset when identifying the causes of genuine fires or false alarms.

In the event of a real fire, investigation into its origins can take place, avoiding the issue of so-called "black-hole" fires, where hangars are damaged to the extent that no evidence explaining the cause of a fire survives.

In the event of a false alarm, the video footage can be reviewed to determine the reason. From the information gathered, learnings can be made and new processes put in place to prevent similar false alarms from reoccurring.

# Intelligent Visual Flame Detectors with 3D mapping

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The benefits of IVFDs can be taken even further when combined with 3D mapping.

Using widely available hazard mapping technology like HazMap3D, users can assign a risk grade to every area of the aircraft hangar. A graded area is typically one to five metres in size.

Grading an area's hazard risk helps users to explain the likelihood of a fire or the potential impacts of a nearby fire in each area. The risk level can be graded by area use, checking for factors like aircraft presence, liquid hydrocarbon presence, refuelling, maintenance, and moving aircraft.

When grading is complete, IVFDs can be positioned for optimal coverage.

Crucially this allows users to understand when it is necessary to change detector positions, run new assessments and immediately gauge the impact in coverage.

Given their breadth of coverage, fewer detectors are needed, resulting in lower upfront maintenance costs compared with other forms of optical flame and heat detectors.

IVFDs with 3D mapping allow for enhanced flame detection at longer ranges and with fewer false alarms than Optical Flame Detectors like MSIRs.

## In Summary

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- IVFDs are ideal for recognising fires in air hangar settings. Their recording features can help operatives to reduce false alarms and identify the causes of real fires.
- IVFDs with 3D mapping provide even better rates of detection, assessing the risk of every area within the hangar, allowing for optimal detector positioning.
- Overall, IVFDs are more efficient and cheaper to install and maintain than both heat detectors and traditional Optical Flame Detectors.

## GET IN TOUCH

If you'd like to discuss Micropack flame detection products and systems for air hangars, we encourage you to get in touch to discuss your project and offer a reliable solution.



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**\$3 MILLION SAVED PER DAY**

IN LOST PRODUCTION THROUGH THE  
USE OF VISUAL FLAME DETECTION



**OVER 30 YEARS**

PRODUCTS & SERVICES



**50% REDUCTION IN CAPEX/OPEX**

WHEN CARRYING OUT F&G MAPPING

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