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WHITE PAPER

High Expansion Foam Vs ILDFA

Fire protection system at SFO Hangar

In 2020, Ryan Joyce Structural Design [published a white paper](#) on a super bay hangar retrofit for High Expansion Foam fire suppression.

This white paper uses the above mentioned article as the basis for comparison.



Adjusted for inflation, the \$38 million dollar total project cost would be \$46.82 million dollars in 2025.

A new NFPA 409 compliant sprinkler system was included in the total project cost. If we remove the estimated cost of a new sprinkler system, at roughly \$5 sqft for a hangar of this size, the all-in price per square foot for HEF is \$175.

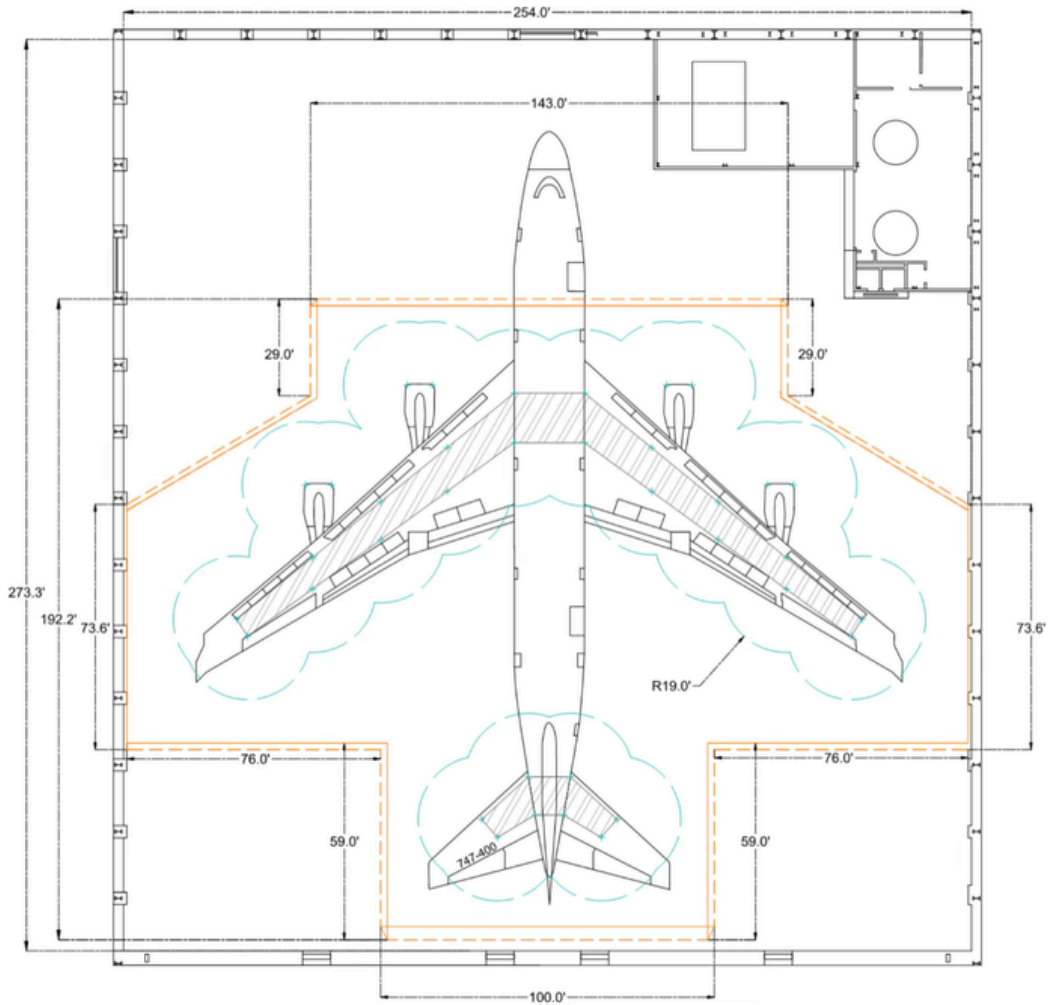
In 2020 ILDFA was not yet included in NFPA 409 code but it has since been adopted as a one to one alternative to AFFF, HEF and F3 in the NFPA 409 2022 Edition.

If the SFO hangar had been able to consider ILDFA, two scenarios would have been possible. The first being "wall-to-wall" coverage, similar to HEF requirements. It's a straightforward calculation at that point of 260,000 sqft multiplied by the price per square foot. Trench design, condition of the slab and containment tank placement all influence the price. Its worth noting that the larger the square footage application, the lesser the impact of peripheral equipment and accommodations are on the total price.

We estimate that for a retrofit hangar of this size, the price per square foot of ILDFA would be around \$121. If this were a newly built hangar, that price would have dropped to around \$95 a square foot. These are turnkey prices that include design, installation, pumps, containment tanks, commissioning and maintenance/inspection/warranty for 10 years.

One advantage ILDFA has over legacy foam systems is it can be localized to the areas of the aircraft where fuel is stored, such as the fuel tanks in the wings and the engines. This allows for a smaller application of the floor where we "silhouette" the aircraft and create a parking spot.

If we assume the three Boeing 747s in the SFO hangar are nosed in and generally parked in the same location, a 35,000 sqft. parking spot layout could be installed for each aircraft. This would total 105,000 sqft of ILDFA in the hangar. The price per square foot would be slightly higher than the wall-to-wall configuration as the peripheral costs are applied over a smaller square footage area. We estimate the price per square foot of this layout to be approximately \$132.



ILDFA Coverage layout based on a 747-400 with tail fuel tank: Approx 35,000 sqft.

The price comparison would be as follows:

	HEF ALL IN	ILDFA WALL TO WALL	ILDFA PARKING SPOT CONFIG	ILDFA PARKING SPOT CONFIG IF NEW BUILT
PRICE PER SQUARE FOOT	\$175	\$121	\$132	\$95
TOTAL PROJECT COST	\$45,500,000	\$31,460,000	\$13,860,000	\$9,975,000
% of HEF	100%	69%	30%	22%

There are more advantages of ILDFA over high expansion foam (or any foam based fire protection system for that matter) than just cost such as:

- ✓ Phased installation, so only partial down time of the hangar
- ✓ Minimal maintenance (there are very few moving parts)
- ✓ Life cycle of 50 years or more
- ✓ No risk of loss of life or injury of accidental foam discharge
- ✓ Environmentally safe, 100% chemical free
- ✓ LEED certification possible due to recycling of flushing water and recycled construction materials (aluminum)
- ✓ Improved day-to-day operation, due to the ability to easily remove and flush daily spills
- ✓ Superior fire protection overall



High Expansion Foam system commissioning at SFO, source: RJSD website



ILDFA installed and commissioned in a Airbus A320 4 bay hangar for Avianor, an MRO based in Mirabel, Canada

We recommend contacting Safespill directly for an estimate. We offer preliminary proposals free of charge. These proposals will include preliminary layouts, installation times and pricing, sufficient to make a proper comparison.

However, estimating the cost of foam-based systems often is less straight forward due to the upstream and downstream requirements for water supply, containment options, structural roof reinforcement, etc. Reputable engineering firms offer feasibility studies that guide the client to the right decision. Contact us and we'll be happy to make a recommendation.

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