

Minimum Performance Standard Testing of a Cargo Compartment Halon Replacement Agent



Federal Aviation
Administration



Presented to: International Aircraft Systems Fire Protection
Working Group, Cologne, Germany

By: FAA Technical Center / AOA / BOEING

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Background

- Fire suppression systems required in Class-C cargo compartments.
 - Halon 1301 used in total flooding fire suppression systems.
- Ban on production of Halon 1301 (Jan. 1994)
 - Mandated by the Montreal Protocol
- Minimum Performance Standard (MPS) developed as one part of the FAA certification process to test replacement systems.



FAA Certification Criteria

- Title 14 CFR 25.851

(b) *Built-in fire extinguishers.* If a built-in fire extinguisher is provided--

(1) Each built-in fire extinguishing system must be installed so that--

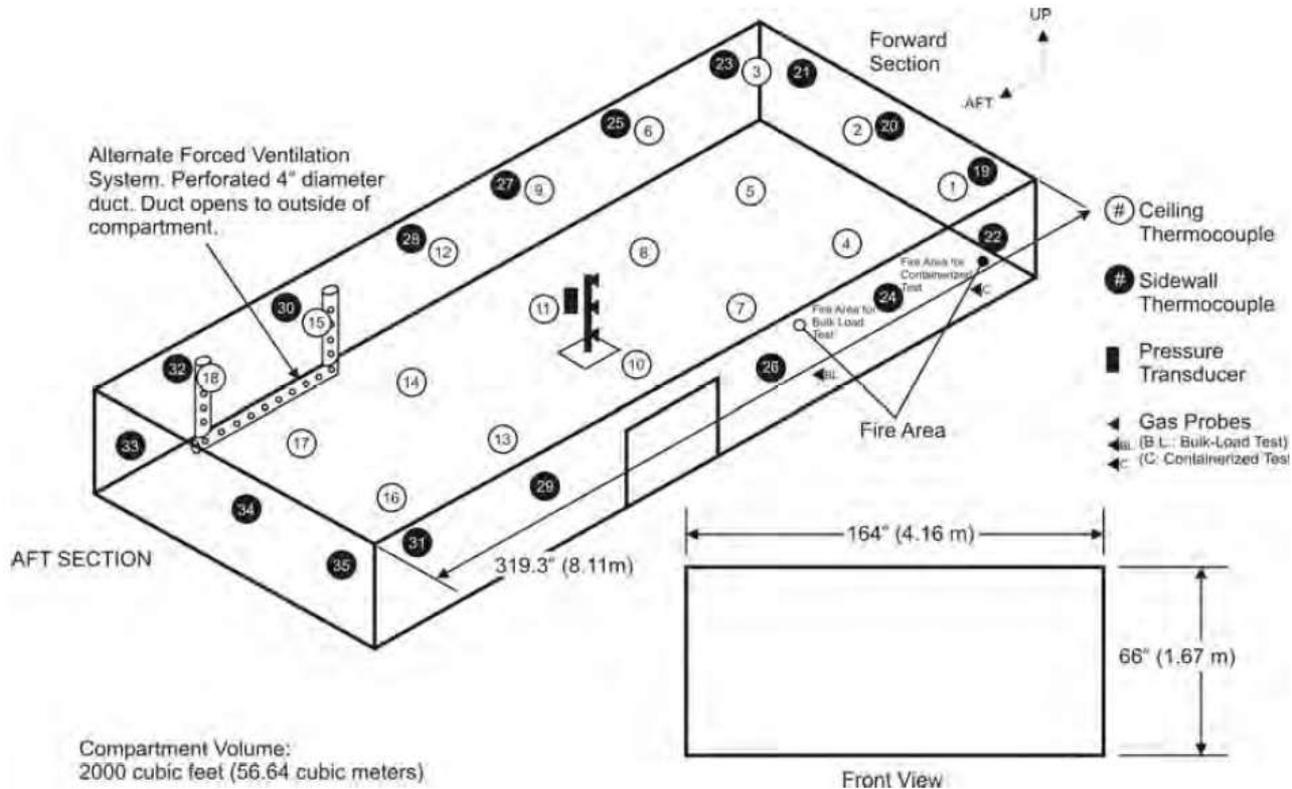
(i) No extinguishing agent likely to enter personnel compartments will be hazardous to the occupants; and (ii) No discharge of the extinguisher can cause structural damage.

(2) The capacity of each required built-in fire extinguishing system must be adequate for any fire likely to occur in the compartment where used, considering the volume of the compartment and the ventilation rate. The capacity of each system is adequate if there is sufficient quantity of agent to extinguish the fire or suppress the fire anywhere baggage or cargo is placed within the cargo compartment for the duration required to land and evacuate the airplane.

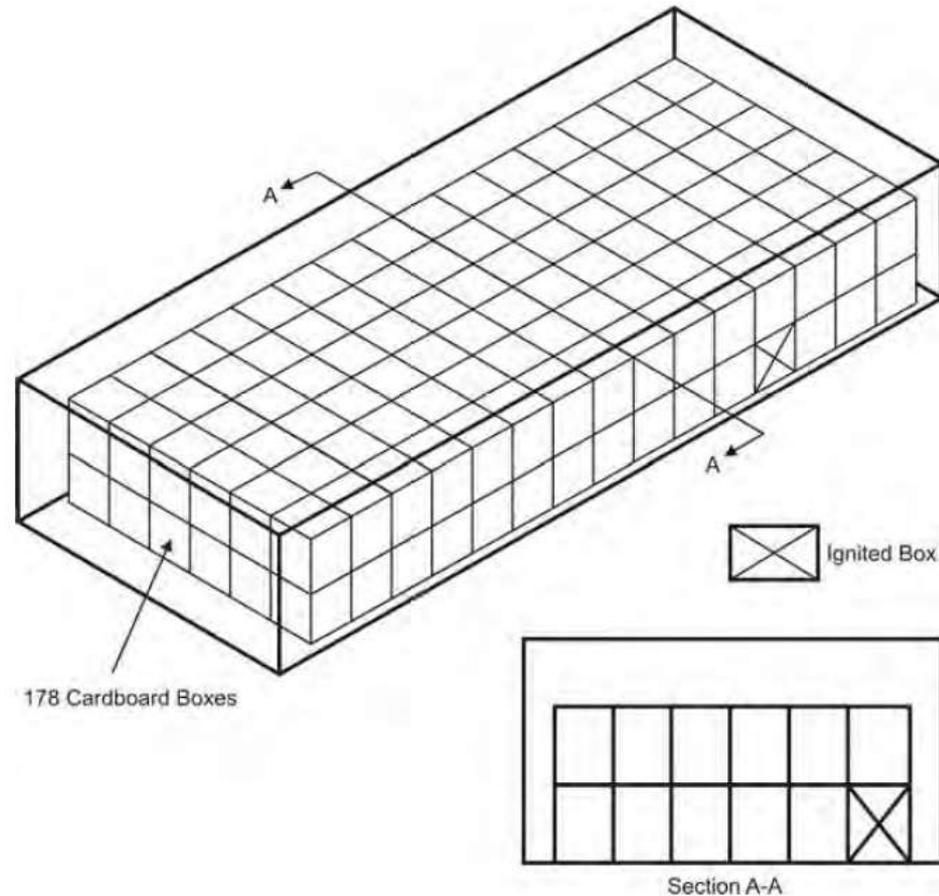
Amdt. 25-142, Eff. 4/18/2016



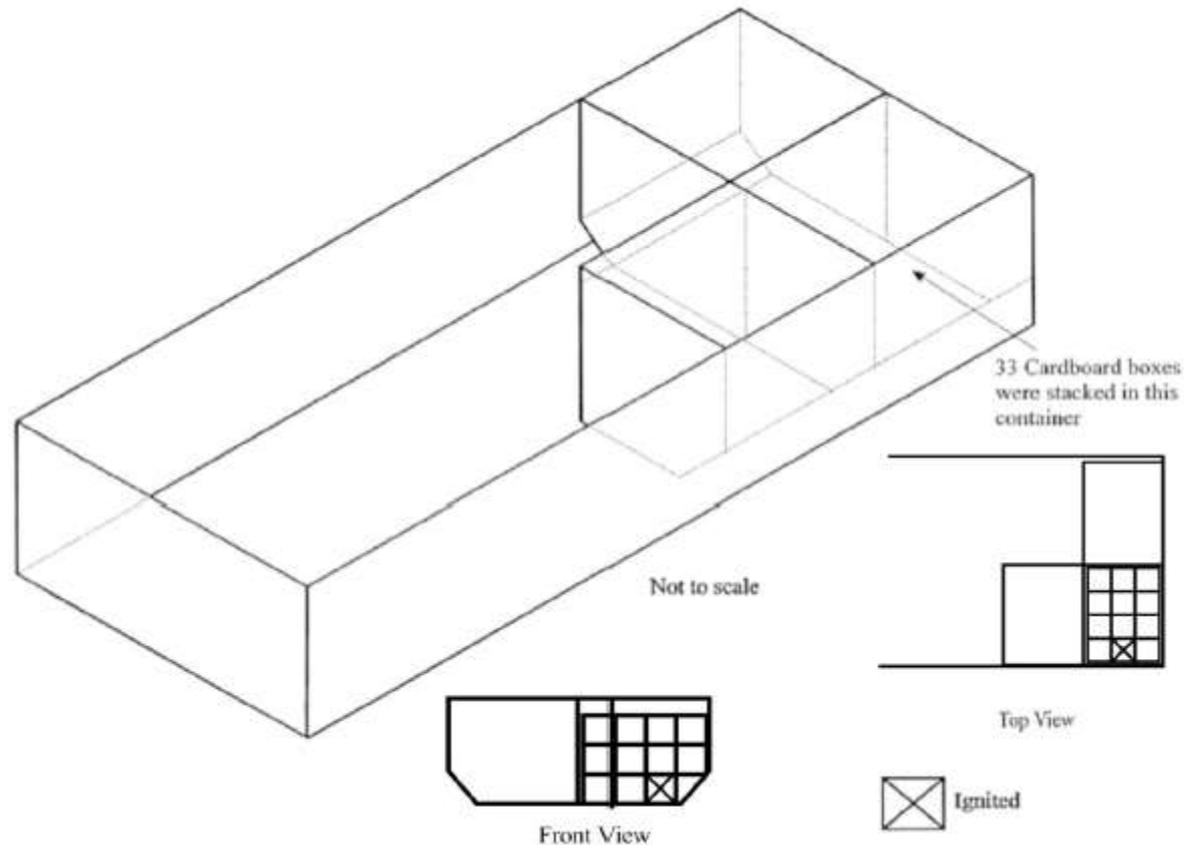
Test Article



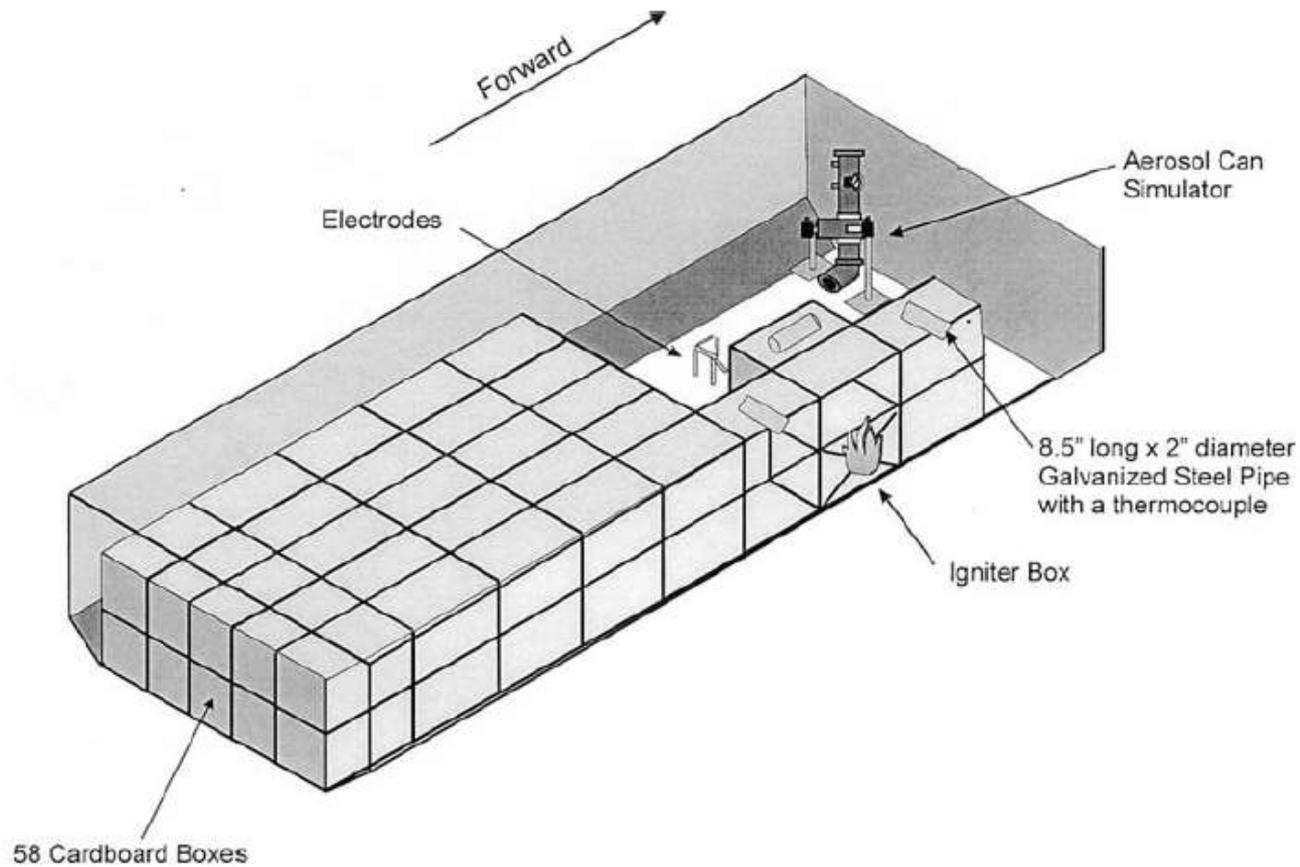
Test Scenario – Bulk Load Fire



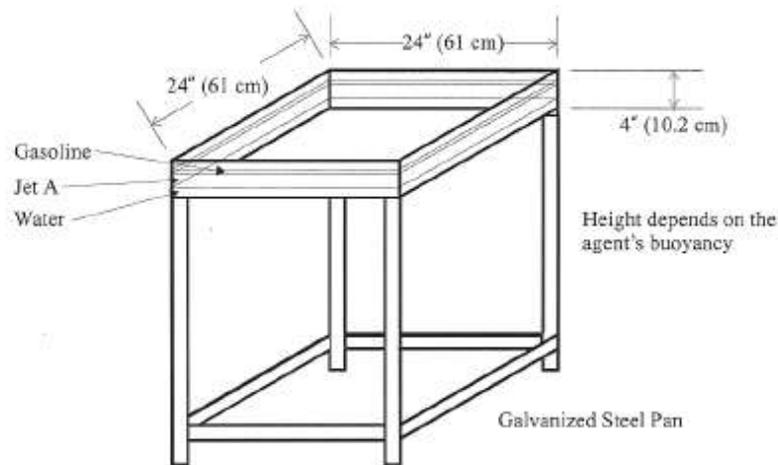
Test Scenario – Containerized Fire



Test Scenario – Aerosol Can Explosion Simulation



Test Scenario – Surface Burning Fire



Pan is placed in a worst case scenario depending upon the location of discharge nozzles.

Replacement Agent Details

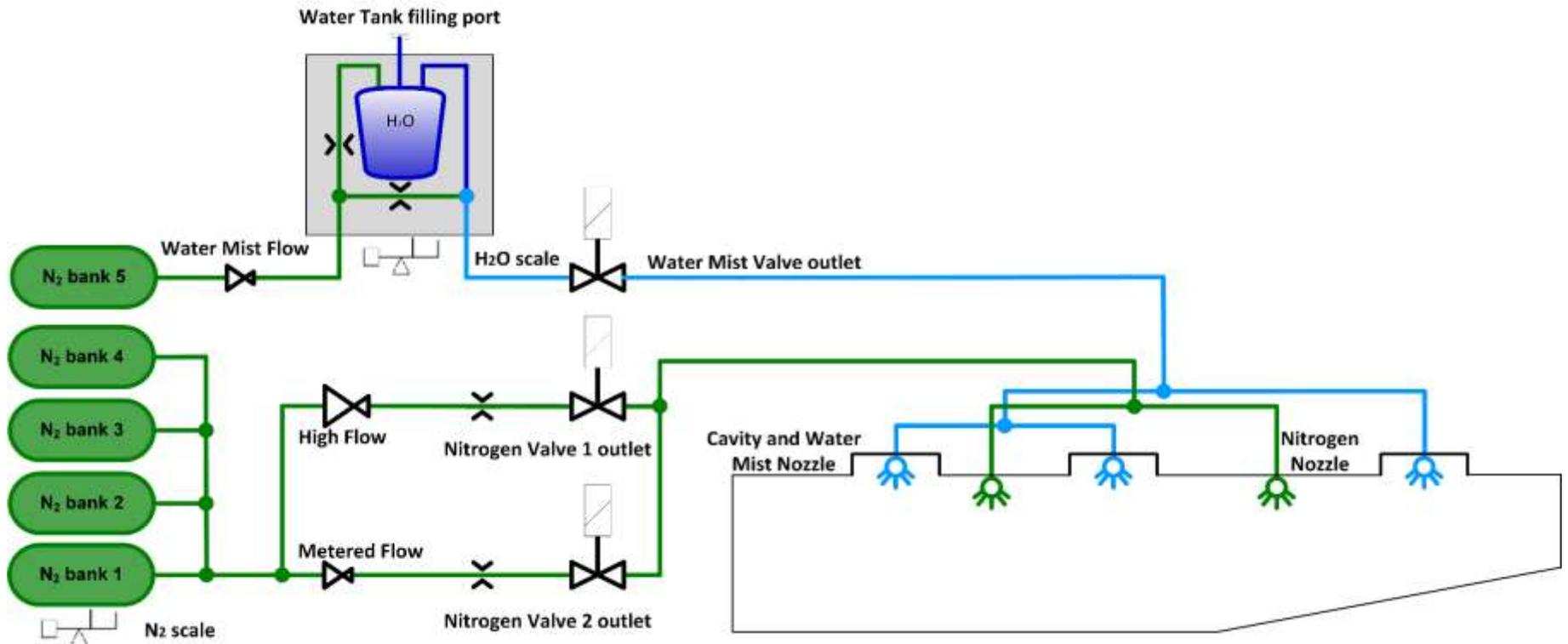
Type: Water Mist + Nitrogen System

Company: AOA

Characterization Criteria Defining the Agent

- **Oxygen Concentration**
- **Cooling Effect**
- **Moisturization**
- **Heat Radiation Shielding**

Water Mist System Setup



Tests Conducted

Test Type	1	2	3	4	5
Bulk Load Fire	X	X	X		
Containerized Fire	X	X	X	X	X
Aerosol Can Explosion	X				
Surface Burning Fire	X	X	X	X	X



Test Campaign Status

- Remaining tests to be conducted by the end of FY2017
- Detailed analysis of results will be presented at the following Systems Working Group Meeting



Questions?

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