

AVIATION MECHANICAL EXTINGUISHING DEVICE



USER MANUAL

PRODUCT OVERVIEW

PRODUCT NAME:	Fireblock Aviation Mechanical Extinguishing (A.M.E) Device
EXTINGUISHING AGENT:	Fireblock TekFoam – A non-toxic, biodegradable, PAFS fluorine free fire suppression gel / foam
FORM:	Foam Gel (encapsulating, cooling, smothering properties)
PACKAGING:	Aerospace-grade aluminium /stainless steel
WEIGHT:	12kg
TARGET FIRE CLASSES:	Lithium – ion fires and can be used on class A, B, C, and F
PATENT NO:	PCT/IB2025/056242

DESCRIPTION

The Fireblock A.M.E Device is a patented, gas-free fire extinguishing device engineered specifically for the aviation sector. Unlike traditional extinguishers that rely on compressed gases such as Halon or Halotron, which are ozone-depleting, toxic, and can displace oxygen at high altitudes, this unit operates entirely via a mechanical pressure system, eliminating the risks associated with toxic gas discharge, altitude-related pressure fluctuations, and regulatory constraints.

Mechanically it is charged to 14 bar operating pressure, it delivers Fireblock TekFoam, a non-toxic, biodegradable, PAFS fluorine free fire suppression gel/foam that encapsulates heat, smothers flames, and adheres to surfaces to prevent re-ignition. Its design is optimised for confined spaces and sensitive environments such as aircraft cabins, galleys, cargo holds and submarines.

Constructed from aerospace-grade materials and featuring a manual trigger mechanism, it ensures quick, intuitive operation even under duress. With zero reliance on gas propellants and minimal maintenance requirements, it offers a sustainable and safer addition to current gas-based suppression systems.

LITHIUM -ION BATTERY FIRE CHARACTERISTICS AND HAZARDS

01

THERMAL RUNAWAY:

Lithium-ion batteries can enter a state of thermal runaway when damaged, overcharged, or exposed to heat. This reaction results in a rapid, uncontrolled rise in temperature that can exceed 1,000°C, igniting flammable electrolytes and surrounding materials.

02

EXPLOSIVE BEHAVIOUR:

As internal pressure builds during thermal runaway, batteries may rupture or explode, ejecting molten metal, burning fragments, and toxic vapours. Multiple cells in proximity can trigger a chain reaction, rapidly escalating the incident.

03

TOXIC GAS EMISSIONS:

When burning, lithium-ion batteries release a mixture of highly toxic and corrosive gases, including hydrogen fluoride (HF), carbon monoxide (CO), and phosphoryl fluoride (POF₃). These pose significant inhalation and corrosive hazards, particularly in enclosed spaces such as aircraft cabins or cargo compartments.

04

POST-FIRE REIGNITION RISK:

Even after the visible flames are extinguished, residual heat and internal instability can cause re-ignition hours later. For this reason, compromised batteries must be isolated and cooled—for example, by placing them in a lithium containment box for the remainder of the flight or storage period.

OPERATIONAL NOTE:

Fireblock TekFoam is engineered to mitigate these hazards by rapidly cooling the reaction, encapsulating toxic particulates, and creating a physical barrier that prevents oxygen ingress—significantly reducing the risk of reignition or further propagation.

CERTIFICATIONS AND INTENDED USE

As this unit functions as a mechanical extinguishing device rather than a traditional gas-propelled extinguisher, it does not fall under the same certification requirements that apply to conventional extinguishers. It is not intended to replace existing aviation fire-safety equipment or protocols, but rather to complement them—providing an immediate first-response tool for on-board incidents.

Capable of handling Lithium-ion fires, electrical, Class A (solid combustibles), and oil-based fires, the Fireblock A.M.E Device is the most versatile and practical first line of defence available to flight crews today.

APPLICATION AREAS

This extinguishing device is engineered for multiple aviation environments:

- Commercial Aircraft: Cabin and Galley
- Private Jets & Charters
- Helicopters & Light Aircraft
- Ground Crew and Airport Fire Kits

HOW IT WORKS

The Fireblock A.M.E Device operates without compressed gases. It features a fully mechanical chamber pressurised manually instead of with gases to 14 bar and released upon manual trigger. Once deployed, the unit propels Fireblock TekFoam directly onto the fire surface:

1. Heat Encapsulation – Rapidly absorbs and dissipates heat
2. Oxygen Deprivation – Smothers flames without using gas
3. Surface Cling – Adheres to vertical and overhead surfaces

KEY FEATURES

FEATURE	DESCRIPTION
Gas-Free Operation	Fully mechanical – no compressed Halon or Halotron, or substitutes
Safe at Any Altitude	No pressure fluctuations, even in unpressurised cabins
Non-Toxic Agent	Uses Fireblock TekFoam – safe for people and equipment.
Lightweight Design	Made from aerospace-grade aluminium /stainless steel
Reusable Housing	Chamber system allows for cleaning, refill, and reuse
Eco-Friendly	Gel is biodegradable; extinguishing device contributes no ozone-depleting gases
Simple Deployment	Easy to activate; suitable for minimal training environments Can be used on it side or upside down.

CORE BENEFITS

- 1.No toxic gases released from pressurization
- 2.No oxygen displacement during discharge
- 3.Safe in confined aircraft environments
- 4.Maintenance-friendly & cost-effective
- 5.Reusable and sustainable
- 6.Easy for cabin crew to train and operate
- 7.Complies with future gas phase-out mandates (Montreal Protocol)

FIRE CLASS COMPATIBILITY

FIRE CLASS	DESCRIPTION	CLASS USES
Class A	Solid combustibles (paper, plastics)	✓
Class B	Flammable liquids (jet fuel, oils)	✓
Class C	Electrical fires (wiring, equipment)	✓
Class F	Cooking oils and greases	✓
Lithium-Ion	Devices, batteries, portable gadgets, external battery banks	✓

SPECIFICATIONS

FEATURE	VALUE
Suppression Pressure	14 bar (mechanical)
Fire Classes	A, B, C, F, Lithium-Ion
Activation	Manual/mechanical release trigger
Design	Fully mechanical – gas-free
Weight	12kg
Size	Compact – suitable for aviation storage bins
Material	Aerospace-grade aluminium / stainless steel

BENEFITS

FEATURE / RISK	HALON EXTINGUISHERS	FIREBLOCK A.M.E DEVICE
Extinguishing Method	Gas-based (Halon)	Mechanical pressure system, gas-free
Toxicity / Safety	Toxic at high concentrations; can displace oxygen in confined spaces	Non-toxic; safe for passengers, crew, and equipment.
Altitude Performance	Pressure and discharge can be affected by high-altitude conditions	Mechanical system ensures consistent operation at any altitude
Environmental Impact	Ozone-depleting; banned for new production under Montreal Protocol	Eco-friendly; fully biodegradable gel/foam PFAS free; no ozone depletion
Supply & Maintenance	Scarce and expensive; requires specialized refill and handling	Minimal maintenance; refillable gel cartridge; no gas testing required
Post-Discharge Effects	Residual gas can linger, requiring ventilation; potential equipment contamination	No residual gases; gel clings to surfaces and prevents re-ignition
Target Fires	Effective on A, B, C, fires but does not work on Lithium-Ion battery fires.	Effective on A, B, C, F, and Lithium-Ion fires; encapsulates heat and prevents re-ignition
First-Line Response	Requires careful use; PPE recommended	Immediate deployment; minimal training; safe for cabin crew

Summary: Halon extinguishers are effective at fire suppression but pose health, environmental, and operational risks in aircraft, especially in confined or sensitive environments like cabins, galleys, and cargo holds.

CURRENT IN-FLIGHT RESPONSE VS FIREBLOCK MECHANICAL EXTINGUISHING DEVICE

STEP	CURRENT IN-FLIGHT RESPONSE (HALON/TRADITIONAL EXTINGUISHER)	FIREBLOCK A.M.E DEVICE
1	Crew dons' personal protective equipment (PPE) to mitigate exposure to toxic gases from both the Halon gas and the lithium-ion fumes	Despite being a nontoxic agent, PPE should be used due to the toxicity of the fumes and the intensity of Lithium-Ion Battery fires.
2	Locate and deploy Halon or Halotron extinguisher, which relies on pressurized gas discharge.	Directly target fire source with Fireblock TekFoam gel via mechanical pressure system.
3	Attempt to contain fire while monitoring gas dispersion and oxygen displacement. Does not extinguish a lithium-ion battery fire.	Gel/ Foam encapsulates heat, smothers flames, and adheres to surfaces to prevent re-ignition. Extinguishes a lithium-ion battery fire and stops thermal runaway.
4	Risk of smoke and gas exposure remains; ventilation may be required post-discharge.	Non-toxic gel/ foam leaves no harmful residues; safe for passengers and crew, Smoke from a Lithium-ion battery fire is extremely toxic and ventilation is required for these fumes
5	Potential need for aircraft descent, emergency landing, or diversion if fire cannot be controlled.	Fire neutralized rapidly, reducing risk of escalation; no emergency procedures required, maintaining operational continuity.

MAINTENANCE AND RECHARGING

- Inspection Interval: Comprehensive operational check recommended every 6 months, including verification of mechanical trigger function and chamber integrity.
- Repressurisation: Performed exclusively at approved Fireblock service centres to ensure correct mechanical pressure calibration.
- Gel /Foam Refill: Replace or refill Fireblock TekFoam cartridge/chamber following manufacturer-specified procedures to maintain extinguishing performance.
- Gas Cylinder Testing: Not required, as the system is fully mechanical and gas-free.

ENVIRONMENTAL AND SAFETY CONSIDERATIONS

- Fireblock TekFoam: Fully biodegradable, PAFS free, non-corrosive, and chemically stable under operational conditions.
- Human & Equipment Safety: Non-toxic and non-ozone-depleting; safe for cabin occupants, ground crew, electronics, sensitive avionics, and other critical aircraft systems.
- Operational Safety: Zero oxygen displacement and negligible risk of exposure to confined-space hazards during discharge.

TRAINING DEPLOYMENT

- Crew Training: Is done by Fireblock (Pty) Ltd or Authorised trainer.
- Personal Protective Equipment (PPE): Despite the non-toxic nature of Fireblock products, it is advisable to wear appropriate PPE and initiate relevant safety protocols when responding to any fire incident. Lithium-ion battery fires, in particular, burn at extremely high temperatures, may explode, and release toxic gases, requiring careful handling and adherence to established aviation safety procedures.
- Rapid Response Capability: Designed for immediate application to lithium-ion, electrical, flammable liquid, solid combustible, and oil-based fires.

CONTACT & ORDERING

Now available for orders

For specifications, demonstrations, or distributor partnerships:

Email: support@fireblock.co.za

Website: www.fireblock.co.za

Headquarters: Fireblock (Pty) Ltd, South Africa

LEGAL & COMPLIANCE NOTICE

Fireblock A.M.E Device is a patented product. Usage and distribution must adhere to licensing terms. Use of the extinguishing device must align with local aviation authority approvals and aircraft manufacturer compliance policies.

MATERIAL SAFETY AND DATA SHEET

Contact FIREBLOCK ® for SDS Safety Data information sheet or [click here](#).

WARRANTY INFORMATION

Fireblock A.M.E Device comes with a 1 year warranty against manufacturing defects. This warranty does not cover misuse, improper storage or accidental damage.

For assistance or claims, contact our customer support team at Fireblock (Pty) Ltd: support@fireblock.co.za.

EMERGENCY CONTACT INFORMATION

In case of a fire emergency beyond the capacity of this product, immediately evacuate and follow aviation emergency protocols.

LIABILITY DISCLAIMER

Use of Fireblock A.M.E Device constitutes acceptance of the following:
Fireblock (Pty) Ltd disclaims liability for indirect damages, operational losses, or environmental penalties arising from improper use. Users must confirm suitability and regulatory compliance for their specific application. Always follow manufacturer guidelines and local legislation. The manual serves as a guidance based on field tested application procedures. Site conditions may require adaption of the outlined practices. Users must ensure compliance with local safety and aviation regulations, environmental legislation and site-specific risk assessments