

Aero-K[®]



Fire Suppression Systems

Index...

	<u>Pg.</u>
Aerosol features	4
Extinguishing mechanism	5
Generator overview	6
Applications	7
Extinguishing concentration	
comparison: Class B	8
Typical installations	9
Toxicology	10
Specifications	11

What are *Aero-K*[®] aerosol generators?

Aero-K[®] systems provide highly effective, environmentally friendly fire suppression for fires in enclosed facilities and local spaces. Unlike Halon, carbon dioxide, dry chemical, and Halon replacement systems, *Aero-K*[®] systems require none of the pressure vessels, pipe work, and extensive installation manpower associated with these other systems – dramatically reducing the installed cost of the system. The aerosol generators are virtually maintenance free and have a guaranteed shelf life of over 10 years.

Fire Combat's *Aero-K*[®] aerosol generators represent significant advancements over alternative agents and earlier generation aerosol technology. Because of this dramatic increase in effectiveness, space and weight requirements can be decreased by as much as 90% in critical applications.

The *Aero-K*[®] generator's effectiveness is a function of its patented design, unique chemical composition, and the ultra-fine particles produced. *Aero-K*[®] generators produce an aerosol stream, which is both non-toxic and non-corrosive (even in the presence of high humidity).

- Proven technology
 - Developed in the USA
 - Manufactured in USA in ISO 9002 facility
- Utilizes pyrotechnic-based chemistry
- Self-contained unit
 - Consists of solid state charge and cooling blocks
 - Non-pressurized until activation
- Upon activation, aerosol of ultra-fine particles (~2 micron) is dispersed under pressure (~45 psi)
- Agent is:
 - Potassium-based; extremely effective
 - 5 times as effective as Halon
 - 10 times as effective as Halon replacements

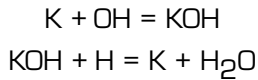
Aerosol features

- Flow characteristics similar to gaseous agents.
Remains suspended in air for extended period of time providing long hold times — up to 1 hour:
- Suppression mechanism:
 - Primary suppression mechanism is chemical interference with free radicals of flame.
 - Interrupts propagation of fire.
 - Secondary mechanisms include:
 - Dilution of flammable medium with inert gases
 - Cooling
- Results in very rapid suppression with a minimal amount of agent
- Weight and space reductions up to 90% over conventional systems
- Environmentally friendly
 - ODP=0
 - No global warming potential
- Non-toxic — level similar to Halon 1301 *
- Non-corrosive even in presence of high humidity and salt atmosphere. Extensive tests run on a wide variety of structural and specialized materials used in electronics and aviation
- Safer than Halon 1301 or Halon replacement agents — no thermal breakdown in presence of fire
- Will not harm electronic equipment or magnetic tape
- Significant installation and maintenance savings — does not require pressure vessels, manifolds, nozzles or pipe work
- Long service life — 10+ years
- Easy clean-up — can normally be quickly vented from the room
- Rugged, corrosion-resistant construction — utilizes stainless steel parts and CR paint system
- Flexible — available in sizes from 100 gram through 2500 gram
- Suitable for Class A, B, C, hazards

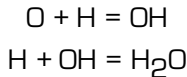
Extinguishing mechanism

“Fire propagation” radicals are essential elements in the propagation of the fire – OH, H, and O. **Aero-K**[®] suppresses the fire (primarily) by chemical interference with these free radicals within the fire zone – thus interrupting the on-going fire reaction.

Potassium radicals (K) are the main active component of **Aero-K**[®] aerosol. They are very active and react with these “propagation radicals” – much like the bromine radicals do in Halons. The chemical reaction may be represented as follows:



In addition, the flame propagation radicals recombine on the surface area of the ultra-fine aerosol particulate to further interfere with flame propagation:

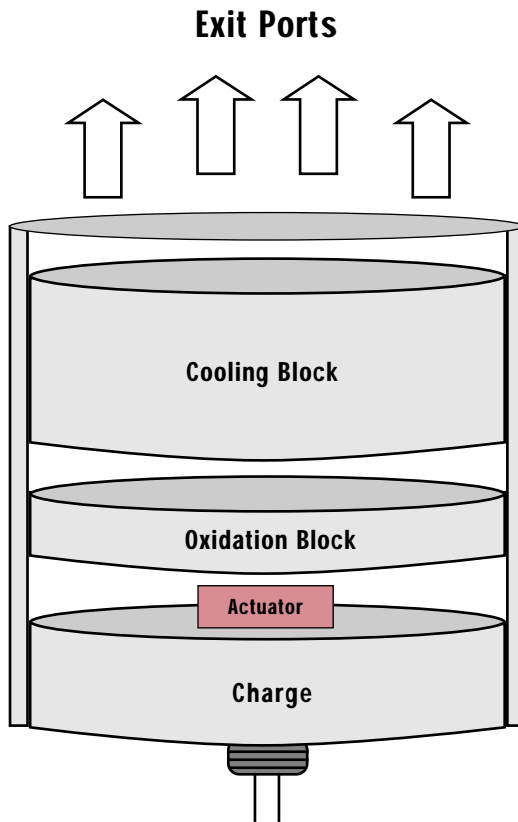


As a result, **Aero-K**[®] delivers extremely rapid suppression times.

* Due to high obscuration factor, systems installed where personnel may be present must include a 60 second time delay and system lockout for “manual only” activation when personnel are in the protected volume.

Generator overview

Each generator is sealed with a non-permeable membrane to maintain the internal integrity of the unit. **Aero-K**[®] aerosol generators are ruggedly constructed with stainless steel mechanical elements and all models are finished with a corrosion resistant paint system designed to protect the generators and insure their reliability in even the most severe operating environments.



Applications

Class A Surface Type Fires <i>solid smoldering materials</i>	Class B Flammable Liquids	Class C Energized Electrical Equipment
---	-------------------------------------	--

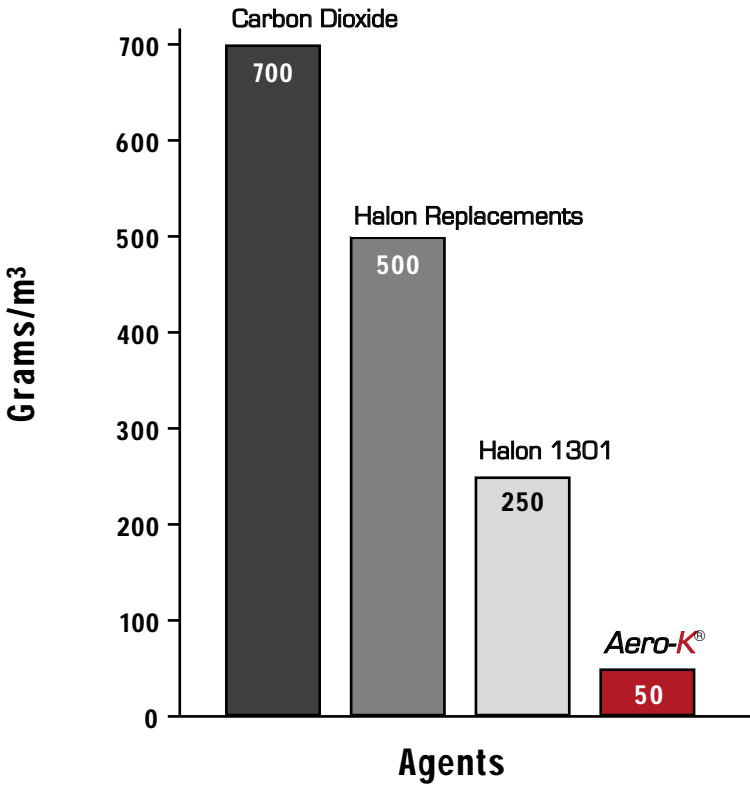
Typical Applications:

- Telecommunications
- Data Processing
- Process Control Rooms
- Power Plants
- Turbine Enclosures
- Flammable Liquid Storage
- Marine Engine Rooms
- High Value Mobile Equipment
- Industrial Equipment
- Storage Vaults

Aero-K[®] systems are not suitable for the following hazards; or, where the following materials may be present:

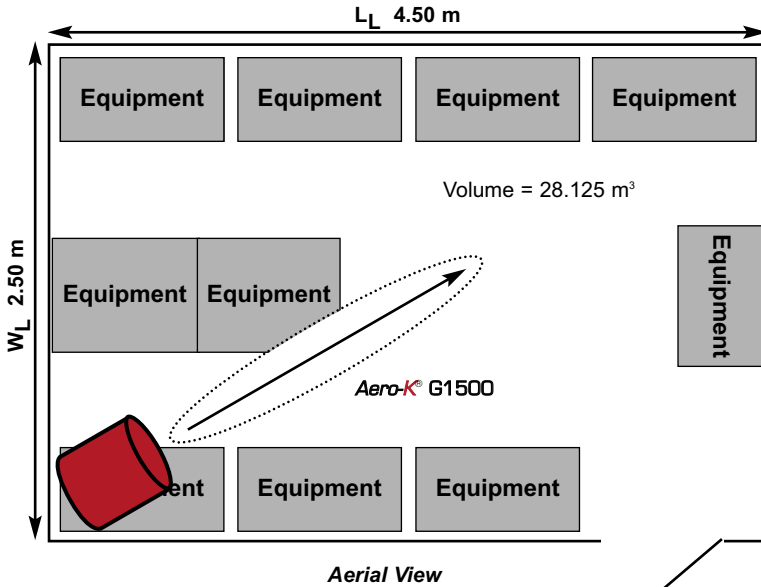
- Fiber and other materials which burn with deep-seated characteristics (e.g., wood, fiber, cotton, etc.)
- Electrical equipment operating at over 40,000V
- Metal hydrides, pyrophoric substances, and chemical substances which smolder and burn without air
- Metal powders (e.g., magnesium, titanium, etc.)

Extinguishing concentration comparison: Class B

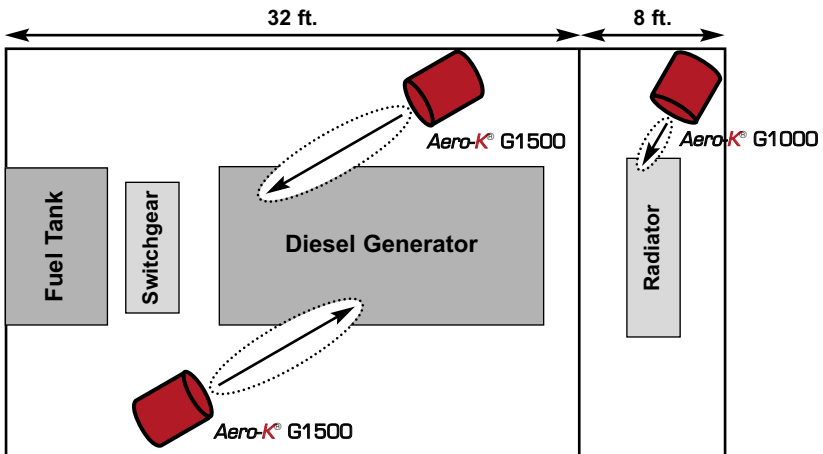


Typical installations

For Mobile Telephone Base Station Equipment Container



For Mobile Generator Trailer



Toxicology

Aero-K® Aerosol Physical Properties Average Values @ 100 gram/m³

Gas Products: (ppm)	Aero-K® 15 minute TWA	Automobile Air Bag Emission Standard 20 minute TWA	NIOSH IDLH
NO ₂	1.08	9.90	20.00
NO	0.97	50.10	100.00
NO _x = NO+NO ₂	2.05	60.00	120.00
CO	84.20	445.00	1,200.00
CO ₂	756.00	40,000.00	40,000.00
NH ₃	58.30	151.50	300.00
Solid Particulate:			Percent
K ₂ CO ₃			55.2%
KHCO ₃			8.2%
KNO ₃			7.9%
Other Potassium Compounds			5.5%
NH ₄ HCO ₃			23.2%
pH in solution = 8.6			
Particle Size Distribution:			Percent
<1 micron			3%
<2 micron			78%
<5 micron			97%
>5 micron			3%
Operating & Storage Conditions:			
Relative Humidity			Up to 98% at +35°C
Temperature			-65°C to +65°C
Shelf Life			10 Years+

Tests conducted by accredited/certified laboratory in the United States

Time weighted average comparison to automobile airbag emission standard & NIOSH (National Institute of Occupational Safety and Health)

Specifications

Parameter	G100	G250	G500	G1000	G1500	G2500
Volume Protected (m ³), Class B @ 50gram/m ³	2.0	5.0	10.0	20.0	30.0	50.0
Extinguisher Charge (grams)	100	250	500	1000	1500	2500
Unit Weight (kg)	0.9	2.2	2.9	5.4	6.8	9.0
Length (mm)	121	150	180	170	203	267
Diameter (mm)	76	127	127	203	203	203
Discharge Time (sec.)	10.0	10.0	19.0	13.0	20.0	33.0
Initiation Current (Amp)						
Parallel	0.5	0.5	0.5	0.5	0.5	0.5
Series	1.0	1.0	1.0	1.0	1.0	1.0
Pulse Duration (milli-sec.)	50	50	50	50	50	50

Application Rates

Class A Surface Fires	100 g/m ³
Class B Flammable Liquids	50 g/m ³
Class C Electrical	75 g/m ³

Transportation Classification

- Classification Code: 1.4S
- UN Identification No: UN 0432
- Packaging Group: PGII



FireCombat

A Division of Sensor Electronics Corporation

5500 Lincoln Drive
Minneapolis, Minnesota 55436
USA

Telephone: (952) 938-9486
Toll Free: 800-285-3651
Fax: (952) 938-9617
Email: info@SensorElectronics.com

www.SensorElectronics.com

Aero-K is manufactured in the USA, and sold worldwide exclusively by Fire Combat, a division of Sensor Electronics Corporation, under license from R-Amtech, International.