

**U.S. Army Corps of Engineers
Fort Worth District
Safety & Occupational Health Office
Lessons Learned**

ACCIDENT: Adverse reaction to inert spray during pepper spray training.

Date: 01 June 2001

WHAT HAPPENED: During a session of the pepper spray course, an employee was sprayed in the eyes with the inert spray while practicing aim and accuracy. The employee suffered severe eye irritation which resulted in swelling of the eyes and severe pain. The employee was unable to open their eyes for 30 minutes after the spraying event. The pain continued for several days and required medical attention. Rinse solution in bottles, which are designed for rinsing the eyes, was on hand, but not a fully functional eye wash station.

CONTRIBUTING FACTORS:

- Improper or no personal protective equipment used.

RESULTS: Employee suffered extreme discomfort and was required to seek medical treatment for this injury.

LESSONS LEARNED:

Reference-EM 385-1-1 USACE Safety and Health Requirements Manual

- **When practicing and training with the inert spray, wear splash proof goggles or a face shield and safety glasses with side shields.**
- **Ensure an adequate eye wash station capable of flushing the eyes for at least 15 minutes is available and working.**
- **If personal protective equipment (goggles or face shield) is not available, then use an inanimate object not a human for aim and accuracy training.**

05.A.01 Responsibilities.

a. Based on hazard assessments, employers shall select, and have each affected employee use, personal protective equipment (PPE) that will protect the employee from hazards.

> See also 06.A.02

b. Employers shall communicate PPE decisions to each affected employee and select PPE that properly fits each affected employee.

c. Employees shall use any PPE that may be required to maintain their exposure within acceptable limits.

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Attached is a copy of the MSDS (material safety data sheet) for both the inert and actual pepper spray.

Guardian Protective Devices. Inc.
P.O. Box 133
West Berlin, NJ'08091

Material Safety Data Sheet

Inert, Non-Flammable
Water Based - Fogger

Product Information

MSDS #: A07
Date: 11-27-00
Edition: 001
Product Name: Water Inert Fog Spray
Product Type: Water Inert Fog Spray

I. Composition

Ingredients:	CAS NO.
Water	N/A
1,1,1,2 Tetraflouroethane	811-97-2

III. Chemical and Physical Properties

Vapor Pressure @ 77 F: 96 psia
Vapor Density Air=1: 3,6 (@77F)
Solubility in Water (WT%): 0.15 WT% @25 C (77F) 14.7psia
Specific Gravity (H2O=1): 1.208 @ 77F
Boiling Point: -26.5C (-15.7F)
Evaporation Rate (BuAc=1): >1
pH: N/A
Appearance: Colorless Liquid Gas
Odor: Slight Ether

IV. Flammability and Explosives Properties

Flash Point: Will Not Burn

Specific Hazard: Contents under pressure. Contents may discharge in fire conditions.
Estimate BMIS Code:

Health Hazard: 1
Flammability Hazard: 0
Reactivity Hazard: I
Personal Protection: goggles

Flammability Limits:

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(% by volume in air) Lower: N/A

(% by volume in air) Upper: N/A

Autoignition Temperature: >743C (1369F)

Sensitivity to Mechanical Impact: Insensitive

Recommended Extinguishing Agents: Non-Flammable

Hazardous Products Formed by Fire or Thermal Decomposition:

Decomposition products are hazardous. The material can be decomposed by high temperatures (open flames, glowing metal surfaces, ect ...) forming hydrofluoric acid and possibly carbonyl fluoride.

Unusual Fire or Explosion Hazards: Contents may discharge in fire.

Compressed Gases: 1, 1, 1,2 Tetrafluoroethane

V. Spill or Leak and Disposal Procedures

Steps To Be Taken in Case of Spill or Leak: Not Applicable **Recommended**

Methods of Disposal: Dispose of in accordance with all federal, state, and local environmental laws.

VI. Storage and Handling Procedures

Storage and Handling: Keep container closed. Store away from heat and light, Store in a clean dry place. Do not heat above 52C (126F)

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VII. Shipping Regulation

DOT Status: Regulated

DOT Hazard Class: 2.2

Proper Shipping Name: 1, 1, 1,2 Tetrafluoroethane

ID. Number: UN3159

DOT/IMO Label: Non-Flammable Gas

Shipping Containers; Tank Cars, Tank Trucks, Ton Tanks, Cylinders

VIII. Reactivity Data

Stability: Stable at ambient temperatures

Hazardous Polymerization: Will not occur

Incompatibility: Incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, ect...

IX. Emergency Treatment Procedures

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Ingestion: Not considered a potential route of exposure.

Inhalation: If symptomatic, move to fresh air. Get medical attention if symptoms persist. Gross overexposure may cause: Central nervous system depression with dizziness, confusion, incoordination, drowsiness, or unconsciousness. Irregular heartbeat with a strange sensation in the chest, "heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing loss of consciousness and death. Suffocation if air is replaced by vapors.

Skin Contact: Wash with soap and water. Immediate effects of over exposure may include: Frostbite if liquid or escaping vapor contacts the skin. Get medical attention if symptoms occur. Eye Contact-. Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses- Get medical attention, "Frostbite-like" effects may occur if the liquid or escaping vapors contact the eyes.

Note to Physicians: Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be used with special caution in situations of emergency life support.

X. Personal Protection

Eyes: Wear safety glasses with side shields (or goggles) and a face shield

Skin: It is a good industrial hygiene practice to minimize skin contact

Ventilation: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances such as poorly ventilated spaces, evaporation from large surfaces, spraying, heating, ect..

Respiratory Protection: If engineering controls do not maintain airborne concentrations to an acceptable level, an approved respirator must be worn. Respirator type: organic vapor. If respirators are used, a program should be instituted to assure compliance with OSHA Standard 29 CFR 1910.134.

XI. Toxicological Information

Skin Irritation (Rat): Slight

Eye Irritation (Rat): Slight to Moderate

Inhalation (Rat): (4 hou, ALC 567000 ppm) Single exposure caused: Cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine.

Lowest-Observed-Adverse-Effect-Level for cardiac sensitization: 75,000ppm.

Single exposure caused: Lethargy. Narcosis. Increases respiratory rates. These effects were temporary. Single exposure to near lethal doses caused: Pulmonary edema. Repeated exposure caused: Increased adrenals, liver, spleen, weight.

Decreased uterine, prostrate weight. Repeated dosing of higher concentrations caused the following temporary effects: Tremors, Incoordination.

Exposure Limits:

ACGIH Threshold Limit Value (TLV): Not Established

OSHA (USA) Permissible Exposure Limits: Not Established

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Guardian Protective Devices, Inc.
P.O. Box 133
West Berlin, NJ 08091
(856)-627-1919

Material Safety Data Sheet
Stream

I. Product Information

MSDS #: A03
Date: 08-15-00
Edition: 001
Product Name: Self Defense Irritant Spray
Product Type: Self Defense Irritant Spray

ii. Composition

Ingredients:	CAS NO.
2- (2- butoxyethoxy) ethanol -----	112-34-5
Oleoresin Capsicum -----	8023-77-6
Nitrogen -----	7724-37-9

III. Chemical and Physical Propertie

Vapor Pressure @ 77 F: .02 mm Hg
Vapor Density Air=1: 5.6
Solubility in Water (WT%): Complete
Speciric Gravity (H20=1): 0.948 @ 77F
Boiling Point: 228 degrees C
Evaporation Rate (ETHER=1): 0.01
pH: N/A
Appearance: Orange Liquid
Odor: Pungent, Highly Irritating
Wt. % Volatile.- , 90.0

IV. Flammability and Explosive Properties

Flash Point: 212 degrees F Setaflash closed cup
NFPA Hazard Rating:

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Health Hazard: 1
Fire Hazard: 2
Reactivity Hazard: 0

Specific Hazard: Contents under pressure. Contents will discharge under fire conditions.

Estimate BMIS Code:

Health Hazard: 2

Flammability Hazard: I

Reactivity Hazard: 0

Personal Protection: gloves, goggles, respirator

Flammability Limits: @25 degrees C

(% by volume in air) Lower: .85

(% by volume in air) Upper: 24.6

Recommended Extinguishing Agents: Foam, Dry Chemical

Unusual Fire or Explosion Hazards: Contents will discharge in fire.

Compressed Gases: Nitrogen

Pressure at Room Temp.: 90 PSIG

V. Spill or Leak and Disposal Procedures

Steps To Be Taken in Case of Spill or Leak: Absorb on appropriate sorbant, provide increased ventilation. **Recommended Methods of Disposal:** Dispose of in accordance with all federal, state, and local environmental laws.

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VI. Storage and Handling Procedures

Storage: Store below 120 degrees F. in shipping carton provided.

Handling: Handle with care. Keep out of the reach of children.

VII. Shipping Regulation

DOT Hazard Class: N/A

Proper Shipping Name: Consumer Commodity

I.D. Number ORM-D

Reportable Quantity: N/A

VIII. Reactivity Data

Stability: Stable at ambient temperatures

Hazardous Polymerization: Will not occur

Hazardous Decomposition Products (non-thermal): None

Incompatibility: Strong oxidizers.

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IX. Emergency Treatment Procedures

Ingestion: Drink large quantities of water, do not induce vomiting, take immediately to a hospital or physician

Inhalation: Remove to fresh air, give artificial respiration or oxygen if needed. If symptoms persist call a physician.

Skin Contact: Remove contaminated clothing, flush with water for 15 minutes, wash with soap and water, do not cover affected area or use creams or ointments for 6 hours.
Eye

Contact: Remove contact lenses, flush with plenty of water for at least 15 minutes. Consult a physician.

X. Personal Protection

Eyes: Splash Goggles

Skin: Protective Clothing

Ventilation: Adequate natural or forced ventilation

Note: **Fire Fighting Personnel Must Use Air Pack**

XI. Health Hazard Data

Toxicity: Strong skin and eye irritant. Harmful if Swallowed

Primary Routes of Entry: Inhalation, skin, ingestion

Signs and Symptoms of Exposure: Respiratory and skin irritation, very high inhaled amounts may cause dizziness, unconsciousness, and asphyxia. Skin contact may cause local irritation or a general allergic reaction in sensitive individuals.

Existing Conditions Aggravated by Exposure: Certain allergies in sensitive individuals

Exposure Limits:

Ingredients:

2-(2-butoxyethoxy) ethanol: No limits established

	Target Organs
Ingredients:	Organs
2- (2- butoxyethoxy) ethanol	OCU
Oleoresin Capsicum:	IRR, OCU, RES

Target Organs

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ALG: Allergen

Ocular

GSA: Gastrointestinal

Cardiac

MUT: Mutagen

Respiratory

BLO: Blood

IRR: Irritant

NER: Nervous System.

OCU:

CAR:

RES: