MATERIAL SAFETY DATA SHEET: Halon 1211

1. Identification of the Substance

1.1 Identification of the preparation

Product Name:	"Halon 1211, BCF"
Chemical Name:	Bromochlorodifluoromethane
CAS No.:	353-59-3
Chemical Formula:	$CBrClF_2$
EINECS Number:	206-537-9

1.2 Use of the preparation

The intended or recommended use of this substance is as a fire-extinguishing agent.

1.3 Company identification

Distributor:	Buckeye Fire Equipment Company
Address:	110 Kings Road, Kings Mountain, NC 28086
Prepared by:	Technical Services Department
Phone:	704.739.7415
Internet address:	www.buckeyef.com
Date of issue:	6/13

1.4 Emergency phone: CHEMTREC 800-424-9300 or 703-527-3887

2. Composition/Information on Ingredients

2.1	Ingredient Name:	Bromochlorodifluoromethane
	Chemical Formula:	$CBrClF_2$
	CAS No.:	353-59-3
	EINECS Number:	206-537-9
	Concentration, Wt%:	>99%
	Hazard Identification:	See Heading 3

3. Hazards Identification

For Humans:

Product:

EU Classification:	Nonflammable gas
R Phrases:	None
S Phrases:	Keep container in a well ventilated place

Limit Values for Exposure:

None known

The National Toxicology Program, I.A.R.C., or OSHA has listed neither this preparation nor the substances contained in it as carcinogenic.

AS PART OF GOOD INDUSTRIAL AND PERSONAL HYGIENE AND SAFETY PROCEDURE, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes, and clothing.

Signs & Symptoms:

Acute Exposure:

Eye Contact:	The liquid form of this material can produce chilling sensations and discomfort.
Skin Contact:	Systemically toxic concentrations are unlikely to be absorbed through the skin. Evaporation from the skin can produce chilling sensations. Skin injury does not result.
Inhalation:	Exposure to concentrations of this material above 4% for longer than one minute can cause toxic side effects. These can include dizziness, impaired coordination, reduced mental acuity, and cardiac effects. Higher concentrations with longer exposures can cause unconsciousness or even death.
Ingestion:	Ingestion is not likely to occur since this material is a gas at room temperature.
Chronic Overexposure:	None known.

Medical conditions generally aggravated by exposure: Cardiac problems.

For Environment:	Relative to the environment, this material has ozone depletion potential and a global warming potential. See Heading 12.

4. First Aid Measures

Eye Contact:	Immediately flush eyes with plenty of water for at least 15 minutes while holding lids open. If redness, itching or a burning sensation develops, get medical attention.
Skin Contact:	Wash the material off the skin with copious amounts of soap and water for at least 15 minutes. If redness, itching or a burning sensation develops, get medical attention.
Inhalation:	Remove victim to fresh air. If cough or other respiratory systems occur, consult medical personnel. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Consult medical personnel.
Ingestion:	If patient is conscious, give 1 or 2 glasses of warm water to drink and get medical attention. DO NOT INDUCE VOMITING. Have victim lie down and keep warm.

NOTE TO PHYSICIAN: Product is an asphyxiant and can induce cardiac muscle sensitization to circulating epinephrine-like compounds. Do NOT give adrenaline or similar sympathomimetic drugs. Do NOT allow victim to exercise until 24 hours following specific exposures. Freeze burns of mucosal tissue can develop following specific exposures.

5. Firefighting Measures

This preparation is an extinguishing media.
Use water to cool fire exposed cylinders or other containers.
Containers are equipped with pressure and temperature relief devices, but rupture may occur under fire conditions and toxic decomposition by-products may be formed if used in fires over 900°C.
There are NO extinguishing media that must not be used for safety reasons.
Self-contained breathing apparatus with full face shield and protective clothing when reentering unventilated fire areas where product has been used.

6. Accidental Release Measures

For personal protection: Prevent skin and eye contact, see Heading 8.
Evacuate area and ventilate to outside atmosphere.
Cool or remove hot metal surfaces or source of non-extinguished flames.
Clean up: This product will vaporize and dissipate into the atmosphere. See Heading 13.
Relative to the environment, this material has ozone depletion potential and a global warming potential. See Heading 12.

7. Handling and Storage

7.1 Handling

Care should be taken in handling all chemical substances and preparations.
See incompatibility information in Heading 10.

7.2 Storage

Store as a liquefied compressed gas in DOT approved pressure vessels away from high temperatures.
If cylinder is not connected to a system, it must be safety capped to protect against actuation of valve and release of agent.
See incompatibility information in Heading 10.
Relative to the environment, this material has ozone depletion potential and a global warming potential. See Heading 12.

7.3 Specific use

The intended or recommended use of this substance is as a fire-extinguishing agent.

8. Exposure Controls/Personal Protection

8.1 Exposure limit values

Limit Values for Exposure:
None known.

8.2 Exposure controls

8.2.1 Occupational exposure controls

8.2.1.1. Respiratory protection

Mechanical ventilation is recommended in low areas or indoors where vapors may collect.
Local exhaust is recommended for most exposures.
Not normally necessary if controls are adequate. For high concentrations exceeding 4%, or if exposure is prolonged, use positive pressure air supplied respirator.

8.2.1.2 Hand protection

Use plastic gloves when handling the liquid.

8.2.1.3 Eye protection

Chemical goggles recommended as mechanical barrier.
Full-face shield is addition if splashing of liquid form is possible.

8.2.1.4 Skin protection

Standard work clothes should provide all protection that is necessary.

8.2.2 Environmental exposure controls

Relative to the environment, this material has ozone depletion potential and a global warming potential. See Heading 12.

9. Physical and Chemical Properties

9.1 General information

Appearance: Colorless gas
Odor: Sweet

9.2 Important health, safety and environmental information

pH:	Not applicable.
Boiling point/boiling range:	-4°C (26°F)
Flash point:	None
Flammability (solid/gas):	Not flammable
Explosive properties:	Not explosive
Oxidizing properties:	Not an oxidizer
Vapor pressure:	37.5 psi @ 70°F; 2,270 kPa @ 20°C
Relative Density:	(Water = 1) 1.83
Solubility:	
-Water solubility:	Negligible
-Fat solubility:	Not determined
Partition coefficient n-octanol/water (Log Pow):	Not determined
Viscosity:	Not determined
Vapor density (air=1)	5.7
Evaporation rate:	Not applicable

9.3 Other information

Auto-ignition temperature:	Does not ignite

10. Stability and Reactivity

10.1 Conditions to avoid

Can be decomposed under fire conditions above 900°F

10.2 Materials to avoid

Active metals and fires involving metal hydrides.

10.3 Hazardous decomposition products

Normally stable.
Hazardous polymerization will NOT occur.
Combustion or decomposition products above 900°F include hydrogen bromide, hydrogen chloride, hydrogen fluoride, free halogens, and small amounts of carbonyl halides. These by-products have a sharp irritating odor. They are dangerous even in low concentrations and in sufficient concentrations can result in personal injury or death.

11. Toxicological Information

Product:

Acute Toxicity Data:	Inhalation LC_{50} (rat)	225,000 ppm. Above 6% caused tremors, narcotic paralysis, spasms and respiratory disorders.
	Inhalation LC_{50} (rat)	31,300 ppm/4 hrs.
	Inhalation LC_{50} (rat)	200,000 ppm/15 min.
	Inhalation (rat)	At 50,000 ppm, no effects were noted. At 75,000 ppm, slightly accelerated respiration was noted. At 100,000 ppm, mild excitement was seen. At 200,000 ppm, within 1 to 2 minutes marked excitation and some convulsions were noted. At 60 to 90 minutes, 2 of the 4 animals died. A concentration of 300,000 ppm immediately gave rise to convulsions and narcosis and all animals died within 50 min.
	Inhalation (dog)	At 25,000 to 75,000 ppm for 3.5 hours, there was reversible myocardial lesions and fatty degeneration of the liver.
Acute Irritation Data:	Skin (rabbit)	Not irritating
	Eye (rabbit)	Not irritating
Chronic Toxicity Data:	Inhalation (rat), for 21 days, dosed 6 hours per day, 5 days per week, at 3,300 ppm. No adverse effects of toxicological significance (NOAEL). At 10,000 ppm, there were signs of central nervous system depression. However, there were no signs of toxicity or histopathological changes observed and no potentiation of cardiac sensitization potential.	
Arnes Test:	Negative	
Reproduction Toxicity:	Inhalation (rat), at 5,000, 10,000 and 15,000 ppm. Neither maternal nor fetal toxicity was observed.	
Other Information:	Inhalation (dog): At 5,000 to 100,000 ppm resulted in cardiac sensitization above 20,000 ppm and in 10 to 0.5 minutes, depending on concentration. Inhalation (human): At 4 to 5% for 1 minute using face mask, subjects at 30 seconds became slightly dizzy and light headed. Over the next few seconds, these symptoms rapidly increased in severity until at 1 minute the subjects felt as though they were about to lose consciousness and exposure was stopped. Paraesthesia of the fingers and other parts of the body was sometimes noted towards the end of the experiment. Heart rate rose by approximately 30% during the early stages of exposure and remained at that level through the experiment. Depression of the T wave was consistently observed on the ECG tracings. The subjects recovered rapidly on cessation of exposure and felt perfectly normal again within 5 minutes. The heart rate and the ECG reverted to normal within 1 minute. There were no delayed after effects.	

12. Ecological Information

12.1 Ecotoxicity

Not determined because of complete partition to the atmosphere.

12.2 Mobility

Bromochlorodifluoromethane is a low boiling point gas and is practically insoluble in water.

12.3 Persistence and degradability

Photodegradation: >50% after 14 years

12.4 Bioaccumulative potential

Not determined.

12.5 Other adverse effects

Ozone depletion potential: Rated as 3 compared to trichlorofluoromethane nominally 1.
Photochemical ozone creation potential: None
Global warming potential: May contribute to global warming.

13. Ecological Information

Relative to the environment, this material has ozone depletion potential and a global warming potential. See Heading 12
Dispose of in compliance with national, regional and local provisions that may be in force.

14. Transport Information

Hazard Class or Division: Class 2.2, UN1974
Label: Nonflammable gas. Chlorodifluorobromomethane or refrigerant gas, R 12B1

Relative to the environment, this material has ozone depletion potential and a global warming potential. See Heading 12.

15. Regulatory Information

EU Classification:	Nonflammable gas
R Phrases:	None
S Phrases:	Keep container in a well-ventilated place.
Limit Values for Exposure:	None known
EINECS Status:	All components are included in EINECS inventories or are exempt from listing.
EPA TSCA Status:	All components are included in TSCA inventories or are exempt from listing.
Canadian DSL:	All components are included in DSL or are exempt from listing.
Environmental restrictions:	Known to destroy ozone in the upper atmosphere.
Restrictions on Marketing & Use:	Check on restrictions because of the environmental effects.

Refer to any other national measures that may be relevant.

16. Other Information

(HMIS) Hazardous Material Identification System Ratings:

Health:	2	4 Severe Hazard
Flammability:	0	3 Serious Hazard
Reactivity:	0	2 Moderate Hazard
		1 Slight Hazard
		0 Minimal Hazard

Format is from directive 2001/58/EC.
EINECS data is from http://exb.jrc.it/existing-chemicals/
The EU Classification has been changed in accordance with Directive 1999/45/EC.
Toxicological information added from the EINICS ESIS (Existing Substances Information System).

17. Disclaimer

The above information is believed to be correct, but does not purport to be all-inclusive and shall be used only as a guide. Buckeye Fire Equipment Company shall not be held liable for any damage resulting from handling or from contact with the above product.