BOC GASES

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: METHYL BROMIDE

1. Chemical Product and Company Identification

BOC Gases,
Division of
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE NUMBER:
CHEMTREC (800) 424-9300

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE NUMBER:
(905) 501-0802
EMERGENCY RESPONSE PLAN NO: 20101

PRODUCT NAME: METHYL BROMIDE
CHEMICAL NAME: Bromomethane
COMMON NAMES/SYNONYMS: Halocarbon 40B1
TDG (Canada) CLASSIFICATION: 2.3
WHMIS CLASSIFICATION: A, D2B, D1A, B1, E

PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 6/1/95
REVIEW DATES: 6/7/96

2. Composition, Information on Ingredients

INGREDIENT	% VOLUME	PEL-OSHA[1]	TLV-ACGIH[2]	LD_{50} or LC_{50} Route/Species
Methyl Bromide FORMULA: CH3Br CAS: 74-83-9 RTECS #: PA4900000	> 99.5	20 ppm TWA, Ceiling Skin	5 ppm TWA, Skin	LC_{50} 302 ppm/8H (rat)

[1] As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

[2] As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

3. Hazards Identification

EMERGENCY OVERVIEW

Corrosive to exposed tissues. Inhalation of vapors may result in dizziness and other nervous system toxicity, pulmonary edema and chemical pneumonitis. Inhalation of high concentrations of this compound may cause dizziness and interfere with normal heart rhythm. Exposure to this material may result in toxicity to the blood, liver and kidneys. Flammable but ignites with difficulty and burns over narrow range. Decomposes into hydrogen bromide and other toxic gases under fire conditions.

ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	Yes	Yes	Yes	Yes

HEALTH EFFECTS:

Exposure Limits Yes	Irritant Yes	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen No
Synergistic Effects None Reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

EYE EFFECTS:
Corrosive and irritating if splashed in eyes. Contact with evaporating liquid product may cause frostbite.

SKIN EFFECTS:
Corrosive and irritating to dermal tissue.

INGESTION EFFECTS:
Corrosive and irritating exposed tissues. Other systemic effects similar to inhalation.

INHALATION EFFECTS:
Exposure to low concentrations may cause dizziness, drowziness, headache and nausea. Higher concentrations are narcotic and toxic to the central nervous system. Effects include blurred vision, mental confusion, numbness, tremors and speech defects.

Methyl bromide is very irritating to the lungs, and vapors may cause pulmonary edema and chemical pneumonitis.

Chronic exposures may result in toxicity to the kidneys and liver and blood.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Individuals with anemia, diseases of the central nervous system or diseases of the kidney or liver should not be exposed to methyl bromide.

NFPA HAZARD CODES	**HMIS HAZARD CODES**	**RATINGS SYSTEM**
Health: 3	Health: 3	0 = No Hazard
Flammability: 1	Flammability: 1	1 = Slight Hazard
Reactivity: 0	Reactivity: 0	2 = Moderate Hazard
		3 = Serious Hazard
		4 = Severe Hazard

4. First Aid Measures

EYES:
Flush eyes immediately with lukewarm water for at least 30 minutes. A physician should see the patient promptly.

SKIN
Remove contaminated clothing and flush affected areas with copious quantities of water. Physician should see the patient promptly if chemical burn results.

INGESTION:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF INGESTION. Physician should see the patient promptly. Call the local poison control center for advice.

INHALATION:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARDS. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area and given artificial resuscitation and supplemental oxygen. Medical assistance should be sought immediately. The physician should be instructed not to use adrenaline as a stimulant in cases of methyl bromide poisoning. Further treatment should be symptomatic and supportive.

5. Fire Fighting Measures

Conditions of Flammability: Flammable (Ignites with difficulty)		
Flash point: Not Available	Method: Not Applicable	Autoignition Temperature: 999 ^{o}F (537 ^{o}C)
LEL(%): 10	UEL(%): 16	
Hazardous combustion products: Hydrogen bromide, carbonyl bromide and carbon monoxide		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

FIRE AND EXPLOSION HAZARDS:
May form an explosive mixture with air. Flammable mixtures ignite with difficulty.

EXTINGUISHING MEDIA:
Water, carbon dioxide or dry chemical.

FIRE FIGHTING INSTRUCTIONS:
Fire fighters should use self-contained breathing apparatus to protect them from toxic combustion products. If possible, stop the flow of gas. Use water spray to cool containers.

6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical Classification:
Earth ground and bond all lines and equipment associated with the system.

Gasketing materials should be of Teflon ® or Kel-F ®. Reacts with aluminum and its alloys.

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<100 psig) piping or

systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

Protect containers from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where containers are stored to exceed 130°F (54°C). Containers should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty containers should be segregated. Use a "first in-first out" inventory system to prevent full containers being stored for excessive periods of time. Post "NO SMOKING OR OPEN FLAMES" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

For additional storage recommendations, consult Compressed Gas Association's Pamphlet P-1.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

8. Exposure Controls, Personal Protection

EXPOSURE LIMITS[1]:

INGREDIENT	% VOLUME	PEL-OSHA[2]	TLV-ACGIH[3]	LD_{50} or LC_{50} Route/Species
Methyl Bromide FORMULA: CH3Br CAS: 74-83-9 RTECS #: PA4900000	> 99.5	20 ppm TWA, Ceiling Skin	5 ppm TWA, Skin	LC_{50} 302 ppm/8H (rat)

[1] Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.
[2] As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)
[3] As stated in the ACGIH 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents.

ENGINEERING CONTROLS:
Hood with forced ventilation. Use local exhaust to prevent accumulation above the exposure limit. Mechanical (Gen.): In accordance with electrical codes.

EYE/FACE PROTECTION:
Safety goggles or glasses and face shield.

SKIN PROTECTION:
Teflon protective gloves.

RESPIRATORY PROTECTION:
Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

OTHER/GENERAL PROTECTION:
Safety shoes, safety shower, eyewash "fountain.

9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Liquid or vapor	
Vapor pressure	: 29.3	psia
Vapor density (Air = 1)	: 3.35	
Evaporation point	: Not Available	
Boiling point	: 40.3	^{o}F
	: 4.6	^{o}C
Freezing point	: -135.4	^{o}F
	: -93	^{o}C
pH	: Not Available	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H20)	: Slightly	
Odor threshold	: Not Available	
Odor and appearance	: Colorless liquid with a slightly sweet odor	

10. Stability and Reactivity

STABILITY:
Stable

INCOMPATIBLE MATERIALS:
Reacts with aluminum and its alloys, forming methylated aluminum compounds which are spontaneously flammable in air.

HAZARDOUS DECOMPOSITION PRODUCTS:
Hydrogen bromide, carbonyl bromide and carbon monoxide.

HAZARDOUS POLYMERIZATION:
Will not occur.

11. Toxicological Information

MUTAGENIC:
There is experimental evidence that methyl bromide is a human mutagen.

TUMOROGENIC:
There is animal data indicating ingestion of methyl bromide may cause cancer.

OTHER:
Chronic inhalation may result in the developement of albuminuria and other kidney toxicity. The liver may become enlarged.

12. Ecological Information

No data given.

13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Methyl Bromide	Methyl Bromide
HAZARD CLASS:	2.3	2.3
IDENTIFICATION NUMBER:	UN 1062	UN 1062
SHIPPING LABEL:	POISON GAS	POISON GAS

Additional Marking Requirement: "Inhalation Hazard"
Additional Shipping Paper Description Requirement: "Poison-Inhalation Hazard, Zone C"

15. Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III - HAZARD CLASSES:
Acute Health Hazard
Chronic Health Hazard
Sudden Release of Pressure Hazard

SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION:
This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

CAS NUMBER	INGREDIENT NAME	PERCENT BY VOLUME
74-83-9	METHYL BROMIDE	> 99.5

This information must be included on all MSDSs that are copied and distributed for this material.

16. Other Information

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).