MATERIAL SAFETY DATA SHEET

Product Name	**Methyl Bromide**
Product id	8326
Revision date	14/11/2010 **Revision:** 10
Supersedes	11/05/2009

1. Identification of the substance & the company

Chemical name	Methyl bromide
Synonym(s)	Bromomethane, MBr
CAS number	74-83-9
Chemical formula	CH_3Br
Chemical family	Halogenated alkane
Molecular weight	94.94
Type of product and use	A broad-spectrum pesticide widely used as a powerful fumigant. For industrial use
Supplier	ICL-IP America Inc. 622 Emerson Road - Suite 500 St Louis, Missouri 63141, USA Tel:(314)983-7884 Fax:(314)983-7607
Emergency Telephone	Chemtrec (800)424-9300

2. Hazards identification

Emergency overview

Colourless gas, odourless at low concentrations; sweetish odour at very high concentrations. Clear, colourless to straw-coloured liquid under pressure or below 3.5°C. Methyl bromide may be fatal if inhaled and harmful if swallowed or absorbed through the skin. It is a neurotoxin and a severe irritant to the upper and lower respiratory tract, skin and eyes.

Potential Health Effects:

- Eye Contact

Severe irritant
Contact with liquid or high concentrations of gas with the eyes may cause severe but usually reversible injury involving temporary blindness.

- Skin contact

Liquid splashed on clothing or leather or high gas concentrations held in contact with skin, may cause skin burns with large blisters appearing after several hours.
Less severe exposures may cause itching skin rash even after several days.
May be absorbed through the skin in sufficient amount to cause systemic toxicity.

- Inhalation

Acute poisoning from methyl bromide is characterized by marked irritation to the respiratory tract which may lead, in severe cases, to pulmonary edema.
High concentrations may damage the liver, kidneys and central nervous system.
Symptoms of poisoning include headache, dizziness, somnolence, vertigo, blurred vision, slurred speech, nausea and vomiting and possibly convulsions and coma.
ONSET OF TOXIC SYMPTOMS MAY BE DELAYED FROM 30 MINUTES TO SEVERAL DAYS.

- Ingestion

Severe irritant to mucous membranes and toxic poison if ingested, although ingestion is highly unlikely.

Chronic effects/Carcinogenicity

Chronic exposure to low concentrations of methyl bromide may produce central nervous system effects. Signs include mental confusion, lethargy, inability to focus one's eye, incoordination and muscle weakness.
Repeated skin contact may cause dermatitis.

NFPA Ratings (Scale 0-4)

Health = 3, Fire = 1, Reactivity = 0

3. Composition / information on ingredients

Components	CAS No.	Weight %
METHYL BROMIDE	74-83-9	100

4. First-aid measures

A 24-HOUR MEDICAL SURVEILLANCE PERIOD IS MANDATORY IN ALL CASES OF EXPOSURE TO METHYL BROMIDE, EVEN IN THE ABSENCE OF ANY IMMEDIATE SIGNS OF POISONING.

Eye contact

Holding the eyelids apart, flush eyes promptly with copious flowing water for at least 20 minutes. Get medical attention immediately.

Skin contact

Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes. Get medical attention immediately.
All leather items should be discarded. Other contaminated clothing must either be discarded or thoroughly ventilated and washed before re-use.

Inhalation

In case of inhalation, remove person to fresh air
Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.

Ingestion

If swallowed, wash mouth thoroughly with plenty of water. Get medical attention immediately.
****
NOTE: Never give an unconscious person anything to drink.
****

Notes to the physician

Intense vesicant.
Signs and symptoms of toxicity are primarily referrable to the CNS, respiratory tract and the cardiovascular system.
No specific antidote.

5. Fire - fighting measures

Suitable extinguishing media

Carbon dioxide, dry chemicals, foam, water spray (fog).

Fire fighting procedure

Wear self-contained breathing apparatus in positive pressure mode and appropriate protective clothing. If possible stop material flow immediately. Do not extinguish burning gas unless flow can be shut off immediately. Use water spray, fog nozzle or CO2 to keep cylinder cool. If there is no risk, move cylinder away from fire.

Unusual fire and explosion hazards

Although it is considered practically nonflammable, methyl bromide can be ignited with a high energy source of ignition. Containers may rupture violently if exposed to fire or excessive heat for sufficient time.
In confined spaces such as buildings or sewers, there is a danger of vapour accumulation, which may result in explosion in the presence of an ignition source.
Will decompose from ca. 400°C releasing poisonous and corrosive fumes of carbon monoxide and hydrogen bromide.

6. Accidental release measures

Personal precautions

Evacuate area and keep personnel upwind.
Wear self-contained breathing apparatus in positive pressure mode.

Methods for cleaning up

If practicable, stop flow of vapour.
Ventilate and/or allow to evaporate, keeping people away from the area until safe re-entry levels are shown by halide detector.

7. Handling and storage

Handling

Avoid bodily contact.
Use an appropriate monitoring instrument for methyl bromide in any area where it is being stored or handled.
Move and transport containers with requisite care. Do not use hooks, rope sling, etc. to unload. Use hand or fork trucks to firmly cradle cylinders.
Do not bump or drag them.

Storage

Store containers upright, in a secure manner, either outdoors under ambient conditions, or indoors in a well ventilated area, away from seeds, foods/feed-stuffs and human and animal habitation.
Post as a pesticide storage area. Test periodically for leaks by halide leak detector.

8. Exposure controls / personal protection

Exposure Limits :

Components	ACGIH-TLV Data	OSHA (PEL) Data
METHYL BROMIDE 74-83-9	1 ppm skin , A4	C 20 ppm (C 80 mg/m^3),skin

Ventilation requirements

Ventilation must be sufficient to maintain atmospheric concentration below recommended exposure limit.
Mechanical ventilation is recommended. Use local exhaust at source of vapour.

Personal protective equipment:

- Respiratory protection

For escape -
Gas mask with a new organic vapour canister. For any detectable concentration - Self-contained breathing apparatus or supplied-air respirator with a full face-piece.

- Hand protection

DO NOT WEAR GLOVES when working with MBr because of the danger that liquid or concentrated vapour may be trapped inside them.

- Eye protection

Splash-proof safety glasses. CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL.

- Skin and body protection	No specially designed protective clothing is available. Do not wear gloves, impervious boots, finger rings or adhesive bandages on hands when handling this material.
Hygiene measures	When using this material, do not eat, drink or smoke. Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking.

9. Physical and chemical properties

Appearance	Colourless gas, odourless at low concentrations; sweetish odour at very high concentrations. Clear, colourless to straw-coloured liquid under pressure or below 3.5°C.
Boiling point/range	3.5 - 4°C
Melting point/range	-94°C
Flash point	None
Flammable/Explosion limits	
- Lower (% vol)	10
- Upper (% vol)	16
Auto-ignition temperature	537°C
Vapour pressure	1420 mmHg (20°C)
Evaporation rate (ether=1)	>1
Vapor density	3.3 (20°C)
Viscosity	Not applicable
Solubility:	
- Solubility in water	0.132 gr/100ml at 25°C (partial pressure CH3Br - 73 torr) 0.138 gr/100ml at 25°C (partial pressure CH3Br - 108 torr)
- Solubility in other solvents	Infinitely soluble in most organic solvents
pH	Not available
Decomposition temperature	~ 400°C
Partition coefficient (n-octanol/water)	Log Kow - ~ 1.92
Explosive properties	Not available
Oxidising properties	Not available
Particle size:	Not applicable

10. Stability and reactivity

Stability	Stable in sealed containers and under normal conditions

10. Stability and reactivity

Materials to avoid Strong oxidizers, aluminum, tin, zinc and magnesium metals and their alloys, natural rubber and certain types of plastics.

Conditions to avoid Avoid contamination by water Keep away from ignition sources

Hazardous decomposition products CO, HBr

Hazardous polymerization Will not occur

11. Toxicological information

Acute toxicity:

- Rat oral LD50 liquid MBr in corn oil - 104 mg/kg
microencapsulated MBr in corn oil - 133 mg/kg

- Rat inhalation LC50 1175 mg/m^3/8 hour

- Mouse inhalation LC50 1540 mg/m^3/2 hour

Chronic toxicity Chronic exposure to low concentrations of methyl bromide may produce central nervous system effects. Signs include mental confusion, lethargy, inability to focus one's eye, incoordination and muscle weakness.
Repeated skin contact may cause dermatitis.

Mutagenicity Mutagenic by the Ames Test
MBr induced DNA damage in rat testis following inhalation exposure at 250 ppm (6 hours/day for 5 consecutive days).
In vivo, MBr induced sister chromatid exchanges in bone marrow cells and micronuclei in peripheral erythrocytes of female mice exposed by inhalation for 14 days.

Carcinogenicity Studies conducted with MBr, exposing animals both by inhalation (rats & mice) and by oral route (fumigated feed, rats), showed that THERE WAS NO EVIDENCE OF CARCINOGENIC ACTIVITY.
Not included in NTP 11th Report on Carcinogens
IARC Group 3 (animal inadequate evidence, human no data available).

Reproductive toxicity In a two generation reproductive study via inhalation in albino rats, the NOEL was 90 ppm.

Other Single exposure vapour inhalation neurotoxicity study in rats:
---NOEL - 100 ppm
Acute oral toxicity (single dose) study in Beagle dogs:
---Lethal dose - 500 mg/kg
---No clinical signs were observed at 1 mg/kg

12. Ecological information

Information on ecological effects

Methyl bromide is listed in the Montreal Protocol as a controlled substance with an ODP (Ozone Depleting Potential) of 0.6.

Aquatic toxicity :

- 96 Hour-LC50, Fish	3.9 mg/l (Rainbow Trout) 56.28 mg/l (Zebrafish)
- 48 Hour-EC50, Daphnia magna	2.6 mg/l
- 72 Hour-EC50, Freshwater algae	5 mg/l (Selenastrum capricornutum)-(MBr)

Avian toxicity:

- Oral LD50	~ 73 mg/kg (Northern Bobwhite)
- Hydrolysis	Under laboratory conditions (MBr) Half-life at pH 5 - 256.7 hours Half-life at pH 7 - 253.9 hours Half-life at pH 9 - 357.3 hours
Germany, water endangering classes (WGK)	3

13. Disposal considerations

Waste disposal

Contact local and/or state environmental authorities to insure proper compliance. The recommended method is incineration. If a suitable designated combustion chamber is not available, return MARKED containers to supplier.
Observe all federal, state and local environmental regulations when disposing of this material. Crush and bury empty cans.

14. Transportation information

UN No. 1062

DOT

Proper shipping name: Methyl bromide
Hazard Class 2.3: Poisonous gas
Shipping description: Inhalation Hazard; Hazard Zone C
Label: POISON GAS (2.3)
---RQ - 1000 lbs (MBr) Emergency Guide No.123

MATERIAL SAFETY DATA SHEET

Product Name	**Methyl Bromide**
Product id	8326
Revision date	14/11/2010 **Revision:** 10
Supersedes	11/05/2009

IMO	Proper shipping name: Methyl bromide Class: 2.3 Toxic Gases Label: TOXIC GAS (2)
ICAO/IATA	Proper shipping name: Methyl bromide Class: 2.3 Cargo aircraft - Forbidden Passenger aircraft - Forbidden

15. Regulatory information

USA	Reported in the EPA TSCA Inventory. This product is subject to registration under FIFRA
Clean Air Act	Final rule to amend the accelerated phaseout regulations that govern the production, import, export, transformation and destruction of substances that deplete the ozone layer regulated under Title VI of the Clean Air Act Amendments of 1990. The EPA is creating an exemption from the consumption and production phaseout for quantities of methyl bromide that are used for quarantine and preshipment.
CERCLA/SARA - 302 ext. haz. substances	This material contains hazardous substance as defined by CERCLA/SARA and the reportable quantity is 1000 lbs; 454 kg.
- SARA 313	Methyl bromide is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.
- Massachusetts right-to-know list	Listed
- New Jersey right-to-know list	Listed
- Pennsylvania right to know list	Listed
- Illinois toxic substances list	Listed

MATERIAL SAFETY DATA SHEET

Product Name	**Methyl Bromide**	
Product id	8326	
Revision date	14/11/2010	**Revision:** 10
Supersedes	11/05/2009	

- California-Prop 65	Under proposition 65, methyl bromide has been listed by the State of California as a reproductive toxin when used as a structural fumigant. When methyl bromide is used as a structural fumigant, the following labeling must be on the container: "Warning: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm"
- Workplace Classification	This product is considered highly hazardous (HHC) under the OSHA Hazard Communication Standard (29CFR 1910.1200). The Threshhold Quantity (TQ) for this substance is 2,500 lbs.
Canada	Listed in DSL This substance is listed under Part 1, Group 1 Substances in the National Pollutant Release Inventory (NPRI) for 2008. Information about this substance must be reported to the Minister of the Environment in accordance with subsection 46(1) of the Canadian Environmental Protection Act, 1999. This chemical is included on the current phase-out schedule of ozone-depleting substances under the Canadian Environmental Protection Act,1999.
-WHMIS hazard class	A compressed gas D2A very toxic materials D2B toxic materials E corrosive material
EU	Regulated under Article 22 of EC Regulation no.2037/2000 on substances that deplete the ozone layer.
EC No.	200-813-2
Japan	ENCS no. 2-39 ISHL no. 2-39
Australia	Listed in AICS
China inventory	Listed
Hong Kong	Dangerous Goods - Category 2 - Compressed Gases (MBr) Ozone Depleting Substances - Part 6 scheduled substance (MBr)
Korea	Listed in ECL (KE-03676) Toxic chemical No.97-1-113, 1% or more in mixtures (MBr)
Taiwan	Harmful substances

MATERIAL SAFETY DATA SHEET

Product Name	**Methyl Bromide**	
Product id	8326	
Revision date	14/11/2010	**Revision:** 10
Supersedes	11/05/2009	

Philippines Listed in PICCS

16. Other information

This data sheet contains changes from the previous version in section(s)
2, 3, 9

Health, Safety & Environment Policy
We will strive to ensure that our operations and products meet the needs of the present global community without compromising the ability of future generations to meet their needs
We accept that the success of our business is dependent on the supply of products and services that will benefit society whilst ensuring human safety and protection of the environment and natural resources
Within the framework of our commitment to the Responsible Care program, we will provide a healthy and safe work environment for employees and will responsibly manage our products at all stages of their life cycle in order to protect human health and the environment whilst maintaining high production standards of operation

TO MEET THIS COMMITMENT WE WILL:
Comply with or exceed applicable national and international regulatory requirements and other requirements to which we subscribe
Communicate openly and actively encourage dialogue with employees, customers and community concerning our products and operations
Implement documented management systems consistent with and for promotion of the Responsible Care ethics
Develop and supply products that can be manufactured, transported, used and disposed of safely whilst best meeting the needs of our customers
Regularly assess, continually improve and responsibly manage health, safety and environmental risks associated with products and processes throughout their life-cycles
Share knowledge and expertise with others and seek to learn from and incorporate improved practices into our own operations
Educate and train employees, contractors and customers to improve their HSE performance
Communicate up-to-date information to enable our workers, customers and other interested parties to handle our products in a safe and environmentally responsible manner
Endeavor to work with customers, suppliers, distributors and contractors to foster the safe use, transport and disposal of our chemicals
Support Product Stewardship programs in cooperation with customers, distributors and transporters

MATERIAL SAFETY DATA SHEET

Product Name	**Methyl Bromide**	
Product id	8326	
Revision date	14/11/2010	**Revision:** 10
Supersedes	11/05/2009	

Although the information and recommendations set forth herein (hereinafter "information") are presented in good faith and believed to be correct as of the date hereof, Bromine Compounds Ltd. makes no representations as to the completeness or accuracy thereof.
Information is supplied upon the condition that the persons receiving same will make their own determination as to its safety and suitability for their purposes prior to use.
In no event will Bromine Compounds Ltd. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information.
NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE, ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH THE INFORMATION REFERS.

In an event of discrepancy between the contents of this MSDS and the English version of it, the English version shall prevail.

Prepared by

HERA Division in ISRAEL
telephone: +/972-8-6297835
telefax: +/972-8-6297832
www.icl-ip.com
e-mail:msdsinfo@icl-ip.com

End of safety data sheet