

SAFETY DATA SHEET

Product name	Methyl Bromide	
Product id	8326	
Revision date	07/09/2014	Revision: 12
Supersedes	02/01/2012	

1. Identification of the substance & the company

Chemical name	Methyl bromide
Synonym(s)	Bromomethane, MBr.
Chemical formula	CH ₃ Br
Chemical family	Halogenated alkane
Molecular weight	94.94
Type of product and use	For industrial use A broad-spectrum pesticide widely used as a powerful fumigant.
Company	Bromine Compounds Ltd. P.O.B 180, Beer Sheva 84101, Israel Tel +972-8-6297835
Emergency telephone number:	
- For Europe	(+31) 115 689000
- For UK and Ireland	+44 (0) 1270 502891 (24 Hours)
- For USA	Chemtrec (800) 424-9300
- For Asia - Pacific	ALERT-SGS 24 hr Toll Free Number : +800 ALERTSGS (+800-2537-8747) 24 hr Singapore Exchange Number : +65 6542-9595
- For Japan	+81-3-6801-8430

2. Hazards identification

GHS classification	Press. Gas Muta 2, H341 Suspected of causing genetic defects Acute Tox. 3 H331 Toxic if inhaled Acute Tox. 3, H301 Toxic if swallowed STOT RE 2, H373 May cause damage to organs through prolonged or repeated exposure by inhalation. Eye Irrit. 2, H319 Causes serious eye irritation STOT SE 3, H335 May cause respiratory irritation Skin Irrit. 2, H315 Causes skin irritation Aquatic Acute 1, H400 - Very toxic to aquatic life Ozone 1: H420 Harms public health and the environment by destroying ozone in the upper atmosphere
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Label elements

Symbol(s)

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Signal Word DANGER

Hazard statements

- H341 - Suspected of causing genetic defects
- H331 - Toxic if inhaled
- H301 - Toxic if swallowed
- H373 - May cause damage to organs through prolonged or repeated exposure by inhalation.
- H319 - Causes serious eye irritation
- H335 - May cause respiratory irritation
- H315 - Causes skin irritation
- H400 - Very toxic to aquatic life
- H420 - Harms public health and the environment by destroying ozone in the upper atmosphere

Precautionary statements

- P202 - Do not handle until all safety precautions have been read and understood
- P260 - Do not breathe dust/fume/gas/mist/vapors/spray
- P280 - Wear protective gloves/protective clothing/eye protection/face protection
- P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
- P311 - Call a POISON CENTER or doctor/physician.
- P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
- P330 - Rinse mouth
- P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
- P502 - Refer to manufacturer/supplier for information on recovery/recycling

NFPA Ratings (Scale 0-4) Health = 3, Fire = 1, Reactivity = 0

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3. Composition / information on ingredients

Components	Weight %	Index No.	EC No.	EU Classification
METHYL BROMIDE 74-83-9	100	# 602-002-00-2	200-813-2	Press. Gas Muta. 2 H341 Acute Tox. 3 H301 Acute Tox. 3 H331 STOT RE 2 H373 Eye Irrit. 2 H319 STOT SE H335 Skin Irrit 2 H315 Aquatic Acute 1 H400 Ozone 1 H420 (In accordance with CLP 1272/2008) Muta. Cat.3; R68 N; R50 N; R59 T; R23/25 Xi; R36/37/38 Xn; R48/20 (In accordance with DSD 67/548/EEC)

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	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
Inhalation	In case of dust inhalation or breathing fumes released from heated material, 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

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Most important symptoms and effects, acute or delayed

- Ocular	Causes serious eye irritation Contact with liquid or high concentrations of gas with the eyes may cause severe but usually reversible injury involving temporary blindness.
- Dermal	Causes skin irritation 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	Toxic by inhalation. May cause respiratory irritation 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	Toxic if swallowed. Severe irritant to mucous membranes and toxic poison if ingested, although ingestion is highly unlikely.
Notes to the physician	Intense vesicant. Signs and symptoms of toxicity are primarily referable 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).
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.

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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.

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.

Environmental precautions Avoid access to streams, lakes or ponds.

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:

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|-----------------------------------|--|
| - 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.
DO NOT WEAR GOGGLES |
| - 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 | Do not eat, smoke or drink where material is handled, processed or stored. Wash hands thoroughly after handling and before eating or smoking. Safety shower and eye bath should be provided. |

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.
pH	Not available
Melting point/range	-94°C
Boiling point/range	3.5 - 4°C
Flash point	None
Evaporation rate (ether=1)	>1
- Lower (% vol)	10
- Upper (% vol)	16
Vapor pressure	1420 mmHg (20°C)
Vapor density	3.3 (20°C)
- Solubility in water	0.132 gr/100ml at 25°C (partial pressure CH ₃ Br - 73 torr) 0.138 gr/100ml at 25°C (partial pressure CH ₃ Br - 108 torr)
- Solubility in other solvents	Infinitely soluble in most organic solvents
Partition coefficient (n-octanol/water)	Log Kow - ~ 1.92
Auto-ignition temperature	537°C
Decomposition temperature	~ 400°C
Viscosity	Not applicable
Explosive properties	Not available
Oxidising properties	Not available

10. Stability and reactivity

Reactivity	No data available.
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Stability	Stable in sealed containers and under normal conditions
Possibility of hazardous reactions	No data available
Conditions to avoid	Avoid contamination by water. Keep away from ignition sources.
Materials to avoid	Strong oxidizers, aluminum, tin, zinc and magnesium metals and their alloys, natural rubber and certain types of plastics.
Hazardous decomposition products	CO, HBr

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
- Dermal irritation (rabbit)	Irritant.
- Eye irritation (rabbit)	Severe irritant
Dermal sensitization	Exposure in human resulted in redness, congestion, dermatitis, itching, swollen areas and blistering.
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 12th 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

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12. Ecological information

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

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

13. Disposal considerations

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

14. Transportation information

UN No. 1062

IMDG Proper shipping name: Methyl bromide
Class: 2.3 Toxic Gases
Label: TOXIC GAS (2)
Mark: MARINE POLLUTANT

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ADR/RID Proper shipping name: Methyl bromide
 Hazard identification No. 26
 Class 2 : Gases
 Classification Code: 2T
 Label No.: 2.3+13(RID)
 Marking: Environmentally hazardous substance

ICAO/IATA Proper shipping name: Methyl bromide
 Class: 2.3
 Cargo aircraft - Forbidden
 Passenger aircraft - Forbidden
 Marking: Environmentally hazardous substance

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
 Marking: Marine Pollutant

Not regulated as a marine pollutant for surface and air transport in non-bulk (<119 gallons) packagings.

15. Regulatory information

EU Regulated under Article 22 of EC Regulation No. 2037/2000 on substances that deplete the ozone layer.

- Indication of danger Toxic, symbol required (T)
 Dangerous for the environment, symbol required (N)
 Mutagenic Cat. 3

- R Phrases R 23/25 :Toxic by inhalation and if swallowed.
 R 36/37/38 :Irritating to eyes, respiratory system and skin.
 R 48/20: Harmful: danger of serious damage to health by prolonged exposure through inhalation
 R50: Very toxic to aquatic organisms
 R 59 :Dangerous to the ozone layer
 R 68: Possible risk of irreversible effects

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- S Phrases

S 1/2 :Keep locked up and out of reach of children.
 S 15 :Keep away from heat.
 S27: Take off immediately all contaminated clothing.
 S 36/39 :Wear suitable protective clothing and eye/face protection.
 S 38: In case of insufficient ventilation,wear suitable respiratory equipment.
 S45 - In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).
 S 59 :Refer to manufacturer/supplier for information on recovery/recycling.
 S61: Avoid release to the environment. Refer to special instructions/Safety data sheets.

USA

Reported in the EPA TSCA Inventory.
 This product is subject to registration under FIFRA

Australia

Listed in AICS

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.

China

- China inventory

Listed in IECSC

- Hazardous Chemicals List

The substance is included

- Toxic Chemicals List

The substance is not included

Japan

ENCS no. 2-39
 ISHL no. 2-39

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)

Mexico

Listed in the National Inventory of Chemical Substances (INSQ).

New Zealand Inventory

Listed in NZIoC

Philippines

Listed in PICCS

Taiwan

Harmful substances

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16. Other information

This data sheet contains changes from the previous version in section(s)
1(REACH), 2(ANSI), 4, 8, 10, 15

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

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 SDS and the English version of it, the English version shall prevail.

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End of safety data sheet