SAFETY DATA SHEET

Product name	**Methyl Bromide 98%**	
Product id	8326-98LYG	
Revision date	14/11/2011	**Revision:** 6
Supersedes	26/10/2008	

1. Identification of the substance & the company

Chemical name	Methyl bromide
Synonym(s)	Bromomethane, MBr
Chemical formula	CH_3Br
Molecular weight	94.94
Chemical family	Halogenated alkane
Type of product and use	A broad-spectrum pesticide widely used as a powerful fumigant.
Supplier	Lianyungang Dead Sea Bromine Compounds Co., Ltd. Banqiao Industrial Park,Lianyun district, Lianyungang, JiangSu, China 222066 Tel. 86-518-82323651 Fax: 86-518-82253595
Emergency telephone number:	++86-518-2303760/2303504

2. Hazards identification

Adverse human health effects	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. This product contains 2% chloropicrin (trichloronitromethane), which is used as a lachrymatory warning agent, and at this level does not affect the properties of the product, except for its odour.
GHS	
GHS classification	Press. Gas Muta. 2 H341 Acute Tox. 2 H330 Acute Tox. 3 H301 Eye Irrit. 2 H319 Skin Irrit. 2 H315 STOT SE 3 H335 STOT RE 2 H373 Aquatic Acute 1 H400

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Label elements

Signal word Danger

Hazard statements

H341 - Suspected of causing genetic defects
H331 - Toxic if inhaled
H301 - Toxic if swallowed
H319 - Causes serious eye irritation
H335- May cause respiratory irritation
H315 - Causes skin irritation
H373 - May cause damage to organs through prolonged or repeated exposure by inhalation.
H400 - Very toxic to aquatic life
EUH 059 Hazardous to the ozone layer

Precautionary statements

P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe fume/gas/mist/vapours/spray
P284 + P280 - Wear respiratory protection/protective clothing/eye protection/face protection.
P304 + P340- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
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.
P310 - Immediately call a POISON CENTER or doctor/physician
P330- Rinse mouth.

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

3. Composition / information on ingredients

Components	Weight %	Index No.	EC No.	EU Classification

METHYL BROMIDE 74-83-9	98	# 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 EUH059 (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)
TRICHLORONITRO METHANE 76-06-2	2	# 610-001-00-3	200-930-9	Acute Tox. 2 H330 Acute Tox. 4 H302 Eye Irrit 2 H319 STOT SE H335 Skin Irrit 2 H315 (In accordance with CLP 1272/2008) T+; R26 Xi; R36/37/38 Xn; R22 (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

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).
In case of exothermic decomposition and appearance of smoke, water should be used to suppress it.

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.
When heated to decomposition, may release poisonous and corrosive fumes of CO and HBr.

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.

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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 cylinders and cans 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	Weight %	ACGIH-TLV Data	Netherlands national MAC data	UK (WEL) - TWA
METHYL BROMIDE 74-83-9	98	1 ppm skin , A4	0.3 ppm (1 mg/m³), skin	5 ppm (20 mg/m³) STEL -15 ppm (59 mg/m³),10 min
TRICHLORONITRO METHANE 76-06-2	2	0.1 ppm, A4	0.1 ppm (0.7 mg/m³)	0.1 ppm (0.7 mg/m³) STEL -0.3 ppm (2 mg/m³),10 min

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, with a sharp, penetrating odour. 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 available
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

10. Stability and reactivity

Stability	Stable in sealed containers and under normal conditions
Materials to avoid	Strong oxidizers, aluminum, tin, zinc and magnesium metals and their alloys, natural rubber and certain types of plastics.
Conditions to avoid	Keep away from ignition sources Avoid contamination by water
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
Effects of overexposure :	
- Ocular	Severe irritant. Contact with liquid or high concentrations of gas with the eyes may cause severe but usually reversible injury involving temporary blindness.
- Dermal	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.

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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

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 :	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)
- Oral LD50	~ 73 mg/kg (Northern Bobwhite)
Persistence and degradability:	
- 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	Observe all federal, state and local environmental regulations when disposing of this material. 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.

14. Transportation information

UN No.	1062
IMO	Proper shipping name: Methyl bromide Class: 2.3 Toxic Gases Label: TOXIC GAS (2) Mark: MARINE POLLUTANT

ADR/RID	Proper shipping name: Methyl bromide Hazard identification No. 26 Class 2 : Gases Label No.: 2.3+13(RID) Classification Code: 2T 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 Label: POISON GAS (2.3) Shipping description: Inhalation Hazard; Hazard Zone C ---RQ - 1000 lbs (MBr) Emergency Guide No.123 Marking: Marine Pollutant

15. Regulatory information

EU	Regulated under Article 22 of EC Regulation no.2037/2000 on substances that deplete the ozone layer.
EC No.	200-813-2
- Indication of danger	Very Toxic, symbol required (T+) Dangerous for the environment, symbol required (N) Mutagenic Cat. 3
- R Phrases	R 25: Toxic if swallowed. R 26: Very toxic by inhalation. 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 R 50 : Very toxic to aquatic organisms R 59 :Dangerous to the ozone layer R 68: Possible risk of irreversible effects

- S Phrases	S 1/2 :Keep locked up and out of reach of children. S 13 :Keep away from food, drink and animal feeding stuffs. S 15 :Keep away from heat. S 20/21: When using, do not eat, drink or smoke. S 23 :Do not breathe gas/fumes/vapour/spray S 27 :Take off immediately all contaminated clothing. S 36/39 :Wear suitable protective clothing and eye/face protection. S38 - 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 inventory	Listed
Japan	ENCS no. 2-39 (Methyl bromide), 2-199 (Chloropicrin) ISHL no. 2-39 (Methyl bromide), 2-199 (Chloropicrin)
Hong Kong	Dangerous Goods - Category 2 - Compressed Gases (MBr) Ozone Depleting Substances - Part 6 scheduled substance (MBr)
Korea	Listed in ECL (No.KE-03676, KE-34085) Toxic chemical No.97-1-113, 1% or more in mixtures (MBr) Toxic chemical No.97-1-283, 1% or more in mixtures (CP) ; Prohibited Chemicals 99-4-30, 1% or more in mixtures (CP)
New Zealand Inventory	Listed in NZIoC
Philippines	Listed in PICCS

16. Other information

This data sheet contains changes from the previous version in section(s)

2, 3, 5, 9, 10, 14

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End of safety data sheet