

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)

| | | |
|----------------------|---------------------|---------------------|
| Product name | Metabrom 100 | |
| Product id | AS_8326_ICL1 | |
| 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. |
| Supplier | ICL-IP America Inc. 622 Emerson Road - Suite 500 St Louis, Missouri 63141, USA Tel:(314)983-7884 Fax:(314)983-7607 e-mail:msdsinfo@icl-group.com |
| Emergency Telephone | Chemtrec: (800) 424-9300 Medical: PROSAR 1-888-875-1685 (24HRS) |

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 |
|---------------------------|---|

Labels and other form of warning

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

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P264 - Wash hands thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P273 - Avoid release to the environment
P332 + P313 - If skin irritation occurs: Get medical advice/ attention
P337 + P313 - If eye irritation persists: Get medical advice/attention.
P362 + P364 - Take off all contaminated clothing and wash it before reuse
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container in accordance with national and international regulations

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

First aid 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.

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. Call a poison control center or doctor for treatment advise.

Most important symptoms and effects, acute or delayed

- 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.

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| - 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. |

5. Fire - fighting measures

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|---|---|
| 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. |
| 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

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|----------------------------------|--|
| 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. |

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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 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. 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.

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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

Flammable/Explosion limits

- Lower (% vol) 10
- Upper (% vol) 16

Vapor pressure 1420 mmHg (20°C)

Vapor density 3.3 (20°C)

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

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.

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

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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/m³/8 hour
- Mouse inhalation LC50 1540 mg/m³/2 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.

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 13th 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.

Specific Target Organ Toxicity (STOT) - Single exposure May cause respiratory irritation

Specific Target Organ Toxicity (STOT) - Repeat exposure 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.

Aspiration hazard Not expected to occur

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| 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

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|----------------------------------|--|
| 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 |

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

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|-----------------------|--|
| 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. |
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14. Transportation information

| | |
|------------------|---|
| UN No. | 1062 |
| DOT | <p>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</p> <p>Not regulated as a marine pollutant for surface and air transport in non-bulk (<119 gallons) packagings.</p> |
| IMDG | <p>Proper shipping name: Methyl bromide Class: 2.3 Toxic Gases Label: TOXIC GAS (2) Mark: MARINE POLLUTANT</p> |
| ICAO/IATA | <p>Proper shipping name: Methyl bromide Class: 2.3 Cargo aircraft - Forbidden Passenger aircraft - Forbidden Marking: Environmentally hazardous</p> |

15. Regulatory information

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|-------------------------------|--|
| USA | Reported in the EPA TSCA Inventory. This product is subject to registration under FIFRA |
| - EPA Registration no. | 8622-16 |

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| - Emergency overview in accordance to EPA Master Label | <p>DANGER High acute toxicity Extremely hazardous liquid and vapor under pressure. Do not breathe vapor. Inhalation may be fatal or cause serious acute illness or delayed lung or nervous system injury. Liquid or vapor can cause serious skin or eye injury which may have a delayed onset. Do not get liquid on skin, in eyes or on clothing. Methyl bromide vapor is odorless and non-irritating to skin and eyes during exposure. Exposure to toxic levels may occur without warning or detection by the user. This pesticide is toxic to mammals, birds, fish, and aquatic invertebrates.</p> |
| Clean Air Act | <p>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.</p> |
| CERCLA/SARA - 302 ext. haz. substances | <p>This material contains hazardous substance as defined by CERCLA/SARA and the reportable quantity is 1000 lbs; 454 kg.</p> |
| - SARA 313 | <p>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.</p> |
| - Massachusetts Right-to-Know Hazardous Substances list | Listed |
| - New Jersey Right-to-Know Hazardous Substances list | Listed |
| - Pennsylvania Right-to-Know Hazardous Substances list | Listed |
| - Illinois toxic substances list | Listed |
| - California-Prop 65 | <p>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"</p> |

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| - Workplace Classification | This product is considered highly hazardous (HHC) under the OSHA Hazard Communication Standard (29CFR 1910.1200). The Threshold 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 D1A Very toxic material causing immediate and serious toxic effects D2B Toxic materials causing other toxic effects E corrosive material |
| EU | Regulated under Article 22 of EC Regulation No. 2037/2000 on substances that deplete the ozone layer. |
| Japan | ENCS no. 2-39 ISHL no. 2-39 |
| Australia | Listed in AICS |
| New Zealand Inventory | Listed in NZIoC |
| China - China inventory | Listed in IECSC |
| Hong Kong | Dangerous Goods - Category 2 - Compressed Gases (MBr) Ozone Depleting Substances - Part 6 scheduled substance (MBr) |
| Mexico | Listed in the National Inventory of Chemical Substances (INSQ). |
| Korea | Listed in ECL (KE-03676) Toxic chemical No.97-1-113, 1% or more in mixtures (MBr) |
| Taiwan | Harmful substances |
| Philippines | Listed in PICCS |

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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

Note: All sections reformatted in accordance with OSHA Hazard Communication Standard 29 CFR 1910.1200 (GHS)

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, ICL-IP America Inc. 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 ICL-IP America Inc. 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.

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End of safety data sheet