



WORKERS HEALTH CENTRE

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Health And Safety

Fact Sheet

Methyl Bromide

Methyl Bromide as a fumigant

Common or trade names include: Brom-o-Gas, Bromomethane, Celfume, Embafume, Haltox, MB, MeBr, Methogas, Profume, Terr-o-Gas and Zyttox

What is methyl bromide?

Methyl Bromide is a highly effective fumigant used to control a number of pests including insects, rodents, weeds and disease causing organisms in a wide range of agricultural and horticultural crops and in wood products. Its primary uses are for soil fumigation, post harvest protection and quarantine treatments. Methyl bromide is also used as methylating agent, a refrigerant, a fire extinguishing agent, a solvent in dye manufacture, for degreasing wool, for extracting oils from nuts, seeds and flowers and in ionization chambers. Methyl bromide is a color-less gas or liquid under pressure. It may have a chloroform-like odour when it is present in high concentration.

In 1991 methyl bromide was defined as a chemical that contributes to depletion of the ozone layer. Accordingly, it was decided that the manufacture and importation of methyl bromide would be phased out completely by January 1, 2005 in Australia. **However, quarantine and pre-shipment uses are currently exempt.** Most states require permits for application of soil fumigants.

Health effects of methyl bromide

Methyl bromide is highly toxic to humans and animals. It may be inhaled or absorbed through the skin. Acute exposure can cause severe chemical burns of the skin, eyes and airways, delayed chemical pneumonia which produces water in the lungs, severe kidney damage and has devastating effects on the central nervous system. The effects may be fatal.

If a person inhales smaller amounts of methyl bromide it may produce effects that give the appearance of alcohol intoxication such as mental confusion, double vision, tremors, lack of co-ordination and slurred speech. Repeated mild exposures accumulate and cause skin rashes.

The most likely mode of exposure is by inhalation of the gas. The gas cannot be smelt until at dangerous concentrations so exposure above acceptable levels may occur unknowingly. Methyl bromide may also cause burns to the skin or eyes and may be absorbed through the skin. Soil applications are particularly likely to cause burns to the feet and legs.

The effect of methyl bromide poisoning is permanent and irreversible. If any symptoms occur within 24 hours of exposure then medical attention is required.

The risk to health can be reduced considerably by using adequate protection to prevent inhalation and skin and eye contact. Workers who fumigate homes and fields may be exposed to high levels of methyl bromide if proper safety precautions are not followed. Bystanders are also at risk from spray drift. Exposure to soil residues after fumigation is unlikely to cause health effects as methyl bromide quickly evaporates at normal temperatures, although pockets of gas may remain for a short time. The main breakdown product of methyl bromide can be measured in blood samples taken within 1 to 2 days following exposure.

Workers Health Centre has many reported cases of exposure to Methyl Bromide in warehousing and retail workers that cause acute skin irritation, inflammation and respiratory distress.

Methyl Bromide is reportedly found on the surfaces of cartons and packaging and typically found on imported goods.

If this occurs in your sector please contact the Workers Health Centre for further advice and seek medical assistance.

Exposure Standards for methyl bromide

The National Occupational Health and Safety Commission (NOHSC) has determined a maximum exposure standard for methyl bromide:

Time Weighted Average (TWA): 5 ppm (19 mg/m³)

Exposure standards represent airborne concentrations that, according to current knowledge, should neither impair the health of nor cause undue discomfort to nearly all workers. However it should be noted that the exposure standards do not represent 'no-effect' levels which guarantee protection to every worker. The above TWA exposure standards apply to long-term exposure to a substance over an eight-hour day, for a five-day working week.

Safety precautions when using methyl bromide

Under the *Pesticides Act 1999* it is an offence to use a pesticide in a way that is likely to cause injury to another person or harm a non-target plant or animal. It is a legal requirement to read and to follow the instructions on the label of a registered pesticide, although it is allowable to use lower application rates than recommended on the label.

The *Occupational Health and Safety Act 2000* requires that employers provide a safe work environment that includes adequate training, supervision, safe work practices and provision of appropriate personal protective equipment.

Specific measures to reduce the risk of exposure include:

- Where possible use a safer alternative. Non-chemical methods should be selected whenever possible.
- Assess potential risks for harm before application and take steps to minimise risks. Obtain all relevant information regarding surrounding areas.
- Only licensed operators may use methyl bromide.
- Follow the instructions on the label or permit for storage, use and disposal.
- Obtain material safety data sheets (MSDS) for all hazardous substances from the manufacturers and make available to anyone who may be exposed. Keep MSDS to hand as they contain vital information for emergencies.
- Store pesticides in the correct containers with the approved label.
- Use the lowest dosage necessary.
- Spray only in suitable weather conditions to avoid drift outside the target area.
- Ensure people are not downwind of spray.
- Provide adequate buffer areas between the application and dwellings or sensitive areas.
- Provide adequate instructions and training to employees before application is carried out.
- Ensure that employees are trained in emergency procedures.
- Ensure that equipment used is well maintained and calibrated.
- Each person who may be exposed during the operation must wear appropriate personal protective equipment according to the manufacturer's instructions. This includes chemically resistant gloves, boots, and a self-contained breathing apparatus or supplied-air respirator with full face-piece.
- Allow gas to evaporate before entering treated areas.
- Absorb spills with sand or other non-combustible material. Do not allow methyl bromide to enter sewer or storm water drains. Ventilate closed spaces. Isolate hazard area.

First aid

Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin contact

Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed.

Eye contact

Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Ingestion

If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not give anything by mouth to unconscious or convulsive person. (Note for physician: for ingestion, consider gastric lavage)

Alternatives to methyl bromide

The restrictions on the use of methyl bromide for non-quarantine purposes after January 1, 2005 require that suitable alternatives be found. There is no known single alternative fumigant available to substitute for methyl bromide although potential products are currently under development. It is likely that multiple alternative control measures will be required for specific uses. These may include non-chemical alternatives such as crop rotation, resistant crops, irradiation, heat or cold treatments and biological controls.

It should be noted that all chemical alternatives are likely to be toxic to humans. For example, the product Telone®, or dichloropropene, is suggested as an alternative to methyl bromide. Telone®, can also cause severe burns and affects the central nervous system. Non-chemical alternatives are less likely to be hazardous to health and should be chosen wherever possible. It is essential that an assessment be made when determining a suitable alternative that considers the risk to health. Check with the manufacturers for material safety data sheets.

Useful references

Department of Sustainability, Environment, Water,
Population and Communities,
Community Information Unit
1800 803 772
Switchboard
+612 6274 1111
or website: <http://www.environment.gov.au>

Workcover NSW: 13 10 50
The Office of Environment and Heritage (OEH) office
59-61 Goulburn Street, Haymarket NSW 2000
PO Box A290, Sydney South NSW 1232
Telephone: 02 9995 5000
Website: <http://www.environment.nsw.gov.au>

For further information and advice contact the Workers Health Centre

The Workers Health Centre provides a range of quality services in occupational health and safety including:

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| ➤ Medical Screenings & Health Checks | ➤ WHS Training |
| ➤ Hearing Tests | ➤ Rehabilitation & Return To Work |
| ➤ Workplace Assessments | ➤ Related Services In Psychology, Acupuncture And Massage Therapy |

For further information and advice ring us on 02 9749 7666



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