SECTION I - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Meth-O-Gas® 100, Meth-O-Gas® Q, Methyl Bromide (MUP)**
Manufacturer: Great Lakes Chemical Corporation
Address: P.O. Box 2200 **City:** West Lafayette
State: Indiana **Zip:** 47996-2200
Emergency Telephone Number: **1-800-949-5167**
Information Telephone Number: 1-765-497-6100 **Fax:** 1-765-497-6123
Chemtrec Phone: **1-800-424-9300; Internationally call 703-527-3887**
Effective Date: 08/22/2003 **Supercede Date:** 01/03/2001
MSDS Prepared By: Regulatory Affairs Department/Great Lakes Chemical Corporation
Synonyms: Meth-O-Gas, Bromomethane
Product Use: EPA Registered Pesticide
Chemical Name: Methyl bromide
Chemical Family: Alkyl bromide

Additional Information

No information available

SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NO.	%	EXPOSURE LIMITS
Dimethyl ether	115106	~0.2	Y (Hazardous) Not established (OSHA PEL TWA) Not established (OSHA PEL STEL) Not established (OSHA PEL CEIL) Not established (ACGIH TLV TWA) Not established (ACGIH TLV STEL) Not established (ACGIH TLV CEIL)
Methyl bromide	74839	>99.5	Y (Hazardous) Not established (OSHA PEL TWA) Not established (OSHA PEL STEL) C20 ppm (Skin) (OSHA PEL CEIL) 1 ppm (Skin) (ACGIH TLV TWA) Not established (ACGIH TLV STEL) Not established (ACGIH TLV CEIL)
Methyl chloride	74873	~0.2	Y (Hazardous) 50 ppm (OSHA PEL TWA) 100 ppm (OSHA PEL STEL) Not established (OSHA PEL CEIL) 50 ppm (ACGIH TLV TWA) 100 ppm (ACGIH TLV STEL) Not established (ACGIH TLV CEIL)

*Indented chemicals are components of previous ingredient.

Additional Information

EPA Fumigation Limit = 5 ppm

SECTION III - HAZARDS IDENTIFICATION

Emergency Overview: Colorless gas at normal temperatures and pressures
Odorless

SECTION III - HAZARDS IDENTIFICATION

Highly toxic. May be fatal if inhaled.
Toxic. Harmful if swallowed.
Contact can result in chemical burns.
Respiratory distress
Lung damage
Cardiac arrest
May cause central nervous system effects.

Relevant Routes of Exposure: Ingestion, inhalation and skin absorption

Signs and Symptoms of Overexposure: Symptoms appear slowly and include: dizziness, blurred vision, lassitude, sensation of fatigue, staggering gait, slurred speech, nausea, vomiting, lack of appetite, and loss of muscle coordination. High concentrations can cause convulsions, very high concentrations cause lung damage. Prolonged skin and eye contact can cause burns.

Medical Conditions Generally Aggravated By Exposure: Dermatitis
Respiratory disorders

Potential Health Effects: See Section XI for additional information.

Eyes: Chemical burns are possible.
Blurred vision

Skin: Chemical burns are possible.

Ingestion: Toxic. May be harmful if swallowed.

Inhalation: Highly toxic. May be fatal if inhaled. May cause respiratory distress, cardiac arrest and nervous system effects.

Chronic Health Effects: Chronic overexposure may cause neurotoxic effects including peripheral nerve damage and central nervous system effects, respiratory effects and cardiac effects.

Methyl bromide has been classified as Group 3 by IARC. An IARC Group 3 material exhibits limited evidence for carcinogenicity in experimental animals and no human data.

Based on an epidemiology study, methyl bromide may be associated with an increase in prostate cancer risk in both private and commercial pesticide applicators.

May cause genotoxic effects.

Carcinogenicity:

NTP:	No	**ACGIH:**	No
IARC:	No	**OTHER:**	No
OSHA:	No		

Additional Information

No information available

SECTION IV - FIRST AID MEASURES

Eyes: In all cases of overexposure, get medical attention immediately.
Take person to a doctor or emergency treatment facility.
If in eyes, hold eyelids open and flush with steady gentle stream of water for at least 15 minutes.

Skin: In all cases of overexposure, get medical attention immediately.
Take person to a doctor or emergency treatment facility.

SECTION IV - FIRST AID MEASURES

	If on skin, immediately remove contaminated clothing, shoes, and other items covering skin. Wash contaminated skin area thoroughly with soap and water.
Ingestion:	In all cases of overexposure, get medical attention immediately. Take person to a doctor or emergency treatment facility. Do not give anything by mouth to an unconscious person.
Inhalation:	In all cases of overexposure, get medical attention immediately. Take person to a doctor or emergency treatment facility. If inhaled, remove exposed person from contaminated area. Keep warm. Make sure person can breathe freely. If breathing has stopped, give artificial respiration. Give oxygen if needed. If not unconscious, rinse mouth out with water.
Antidotes:	No information available
Notes to Physicians and/or Protection for First-Aiders:	No information available

Additional Information

No information available

SECTION V - FIRE FIGHTING MEASURES

Flammable Limits in Air (% by Volume):	~10-15%
Flash Point:	None
Autoignition Temperature:	Not available
Extinguishing Media:	All conventional media are suitable.
Fire Fighting Instructions:	Wear a self-contained breathing apparatus and protective clothing to prevent skin and eye contact in fire situations.
Unusual Fire and Explosion Hazards:	Under fire conditions, toxic and irritating fumes may be emitted. Containers can explode in fire situations. Use water spray to cool containers exposed to heat. Non-flammable in concentrated form. See Flammable Limits in Air. Methyl bromide is ignitable by a high energy spark at the flammability limits listed above.
Flammability Classification:	Non-flammable gas
Known or Anticipated Hazardous Products of Combustion:	Hydrogen bromide and/or bromine Carbon monoxide and carbon dioxide

Additional Information

No information available

SECTION VI - ACCIDENTAL RELEASE MEASURES

Accidental Release Measures:	Evacuate immediate area of spill or leak. Use a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator for entry into affected area to correct problem. Move leaking or damaged cylinders or containers outdoors or to an isolated location, observing strict safety precautions. Work upwind if possible. Allow spill to evaporate. Do not permit entry into spill area by persons without appropriate respiratory protection until concentration of methyl bromide is determined to be less than 5 ppm.
Personal Precautions:	See Section VIII.

SECTION VI - ACCIDENTAL RELEASE MEASURES

Environmental Precautions: No information available

Additional Information

No information available

SECTION VII - HANDLING AND STORAGE

Handling: Use appropriate personal protection equipment.
Avoid eye, skin and clothing contact.
Do not breathe mist or vapor.
Cylinders should not be subjected to rough handling or mechanical shock such as dropping, bumping, dragging, or sliding. Do not use rope slings, hooks, tongs, or similar devices to unload cylinders. Transport cylinders using hand truck, fork truck or other device to which the cylinder can be firmly secured. Do not remove valve protection bonnet and safety cap until immediately before use. Replace safety cap and valve protection bonnet when cylinder is not in use. When cylinder is empty close, valve, screw safety cap onto valve outlet, and replace protection bonnet before returning to shipper. Only a registrant is authorized to refill cylinders. Do not use cylinders for any other purpose.

Storage: Store upright in a cool, dry, well-ventilated area under lock and key. Post as a pesticide storage area.
Store cylinders upright, secured to a rack or wall to prevent tipping.
Keep container tightly closed.

Other Precautions: Methyl bromide has no odor at dangerous levels and is extremely hazardous.
Do not contaminate water, food, or feed by storage or disposal.

Additional Information

No information available

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: No information available

Ventilation Requirements: Use local ventilation to keep levels below established threshold values.
Use mechanical ventilation for general area control.
Ventilation is essential when indoors.

Personal Protective Equipment:

Eye/Face Protection: Full face shield or safety glasses with brow and temple shields. Do NOT wear goggles.

Skin Protection: Do not use gloves.
Loose-fitting or well ventilated long-sleeved shirt and pants. Shoes and socks. Do NOT wear jewelry, gloves, tight clothing, rubber protective clothing, or rubber boots when handling.

Respiratory Protection: If the concentration of methyl bromide as measured by detector tube exceeds 5 ppm at any time, all persons in fumigation area must wear NIOSH/MSHA approved SCBA.

Consult the OSHA respiratory protection information located at 29CFR 1910.134 and the American National Standard Institute's

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

	Practices of Respiratory Protection Z88.2.
Other Protective Clothing or Equipment:	Pump and detector tubes for determining methyl bromide concentrations.
Exposure Guidelines:	See Section II.
Work Hygienic Practices:	Make sure piping is empty before doing maintenance work. All persons working with methyl bromide should be trained in the hazards, use of required respirator equipment, emergency procedures and in the proper use of methyl bromide as a fumigant where applicable.

Additional Information

No information available

SECTION IX - PHYSICAL & CHEMICAL PROPERTIES

Appearance:	Colorless gas at normal temperatures and pressures. Colorless liquid below boiling point of methyl bromide.	**Percent Volatile:**	Not available
Boiling Point:	38.5 degrees F (3.6 degrees C)	**pH Value:**	Not available
Bulk Density:	Not available	**pH Concentration:**	Not available
Color:	Colorless	**Physical State:**	Gas
Decomposition Temperature:	Not available	**Reactivity in Water:**	Not water reactive
Evaporation Rate:	Not available	**Saturated Vapor Concentration:**	Not available
Freezing Point:	Not available	**Softening Point:**	Not available
Heat Value:	Not available	**Solubility in Water:**	1.75 g/100 g of water at 68 degrees F
Melting Point:	Not available	**Specific Gravity or Density (Water=1):**	1.7 at 0 degrees C
Molecular/Chemical Formula:	CH3Br	**Vapor Density:**	~3.27
Molecular Weight:	94.94	**Vapor Pressure:**	1400 at 68 degrees F, 2600 at 104 degrees F
Octanol/Water Partition Coefficient:	Not available	**Viscosity:**	Not available
Odor:	Odorless	**Volatile Organic Compounds:**	Not available
Odor Threshold:	Not available	**Water/Oil Distribution Coefficient:**	Not available
Particle Size:	Not available	**Weight Per Gallon:**	14.45 pounds

Additional Information

Latent heat of fusion: 62.987 kJ/kg at -93.6 degrees C
Heat of transition: 4.998 kJ/kg at -99.4 degrees C
Specific heat ratio, gas: 1.227 at 101.325 kPa at 25 degrees C

SECTION X - STABILITY AND REACTIVITY

Stability:	Stable under normal conditions of handling and use.
Conditions to Avoid:	None known

SECTION X - STABILITY AND REACTIVITY

Incompatibility With Other Materials: Aluminum
Magnesium
Zinc
Alkali metals
Strong bases

Hazardous Decomposition Products: Thermal decomposition may produce the following:
Hydrogen bromide and/or bromine
Carbon monoxide and carbon dioxide

Hazardous Polymerization: Will not occur

Conditions to Avoid: None

Additional Information

No information available

SECTION XI - TOXICOLOGICAL INFORMATION

VALUE (LD50 OR LC50)	ANIMAL	ROUTES	COMPONENTS
3,120 ppm/15 Minutes	Rat	Acute Inhalation	Methyl Bromide
302 ppm/8H	Rat	Acute Inhalation	Methyl Bromide
214 mg/kg	Rat	Acute Oral	Methyl Bromide

Toxicological Information:
An inhalation LCLo of 60,000 ppm for 2 hours has been found in humans. Methyl bromide is a poison and can cause respiratory distress, cardiac arrest and central nervous system effects. Overexposure may cause neurotoxic effects from which recovery may be slow.
Methyl bromide demonstrates genotoxicity in several test systems at levels above the TLV.

In a two year inhalation cancer bioassay with rats at 3, 30 and 90 ppm no tumors were observed.

In a two generation inhalation reproduction study with rats at 3, 30 and 90 ppm the no observed effect level was 3 ppm. At the higher doses organ weight variation was observed in some offspring.

In a 24 month chronic dietary study in rats, a no observable effect level (NOEL) for systemic toxicity of microencapsulated methyl bromide was considered to be 50 ppm (equivalent to 2.20 mg/kg/day for males and 2.92 mg/kg/day for females). The low observable effect level (LOEL) was considered to be 250 ppm (equivalent to 11.10 mg/kg/day for males and 15.12 mg/kg/day for females) based on reduced food consumption, body weight gains and body weights noted during the first 12 to 18 months of the study. Methyl bromide was not oncogenic upon dietary administration for two years.

In a two year inhalation study in B6C3FI mice, exposed to levels of 0, 10, 33 or 100 ppm for 6 hours per day, 5 days per week, degenerative changes in the cerebellum and cerebrum, myocardial degeneration and cardiomyopathy, sternal dysplasia, and olfactory epithelial necrosis and metaplasia were observed. There was no evidence of carcinogenic activity.

In an EPA/NIH sponsored epidemiology study entitled Agricultural Health Study, pesticides were evaluated based on cancer related deaths and questionnaire results provided by farmers, nursery workers and commercial pesticide applicators in Iowa and North Carolina. Results associated methyl bromide with an increase in prostate cancer risk in pesticide applicators. Exposures to methyl bromide were not confirmed. Incidence and intensity estimations were based solely on self-reporting via a questionnaire. Although the interpretation of the data collected in the study led to a statistically significant increase in prostate cancer risk for methyl bromide applicators, the authors could not rule

out the possibility that the observations may have occurred by chance alone and findings need to be confirmed.

Additional Information

No information available

SECTION XII - ECOLOGICAL INFORMATION

Ecological Information: These products are toxic to fish and wildlife. Keep out of lakes, streams and ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

Additional Information

No information available

SECTION XIII - DISPOSAL CONSIDERATIONS

Disposal Considerations: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Additional Information

Return empty cylinders freight collect to the Great Lakes Chemical Corporation location from which shipment was made. Close cylinder valve by turning clockwise until hand tight. Disconnect lines. Replace safety caps and bonnet. Return partial cylinders only after consulting Great Lakes Chemical Corporation for proper shipping instructions.

SECTION XIV - TRANSPORT INFORMATION

U.S. DOT

Proper Shipping Name:	Methyl Bromide		
Hazard Class:	2.3	**ID Number:**	UN1062
Packing Group:	N/A	**Labels:**	Poison Gas
Special Provisions:	3, B14, T50	**Packaging Exceptions:**	None
Non-Bulk Packaging:	193	**Bulk Packaging:**	314, 315
Passenger Air/Rail Limit:	Forbidden	**Air Cargo Limit:**	25 kg
Vessel Stowage:	D	**Other Stowage:**	40
Reportable Quantity:	1000 lb		

AIR - ICAO OR IATA

Proper Shipping Name:	Forbidden		
Hazard Class:	N/A	**ID Number:**	N/A
Subsidiary Risk:	N/A	**Packing Group:**	N/A
Hazard Labels:	N/A	**Packing Instructions:**	N/A
Air Passenger Limit Per Package:	N/A	**Packing Instruction - Cargo:**	N/A
Air Cargo Limit Per Package:	N/A	**Special Provisions Code:**	A2, A126

WATER - IMDG

Proper Shipping Name:	Methyl Bromide		
Hazard Class:	2.3	**ID Number:**	UN1062
Packing Group:	N/A	**Subsidiary Risk:**	N/A
Medical First Aid Guide Code:	NA		

SECTION XIV - TRANSPORT INFORMATION

Additional Information

Poison Inhalation Hazard
EmS No. F-C, S-U
CERCLA RQs:
Methyl bromide = 1,000 lb
Methyl chloride = 100 lb

SECTION XV - REGULATORY INFORMATION

U.S. Federal Regulations:
The components of this product are either on the TSCA Inventory or exempt (i.e. impurities, a polymer complying with the exemption rule at 40 CFR 723.250) from the Inventory.
These products are offered as EPA registered pesticides.

SARA 313
The following materials are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:
Methyl Bromide (De Minimus Concentration = 1%)
Methyl Chloride (De Minimus Concentration = 1%)

CERCLA Reportable Quantities:
Methyl Bromide = 1,000 lb
Methyl Chloride = 100 lb

SARA RQ:
Methyl Bromide = 1000 lb

OSHA Highly Hazardous Chemicals::
Methyl Bromide, TQ = 2,500 lb
Methyl Chloride, TQ = 15,000 lb

In compliance with Section 611 of the Clean Air Act:
WARNING: Contains methyl bromide, a substance which harms public health and environment by destroying ozone in the upper atmosphere.

State Regulations:
Methyl bromide:
New Jersey Right To Know Hazardous Substance List (1% reporting limit)
Pennsylvania Environmental Hazard List
Massachusetts Extraordinarily Hazardous Substance (1 ppm reporting limit)

Dimethyl Ether:
New Jersey Special Health Hazard Substance List (0.1% reporting limit)
Pennsylvania Hazardous Substance List (1% reporting limit)
Massachusetts Substance List

Methyl Chloride:
New Jersey Special Health Hazard Substance List (0.1% reporting limit)
Pennsylvania Environmental Hazard List
Massachusetts Substance List

International Regulations:
This material (or each component) is listed on the following inventories:
Canada - DSL
EU - EINECS

SECTION XV - REGULATORY INFORMATION

Australia - AICS
Japan - ENCS
Korea - ECL
Philippines - PICCS
China - List I
Canadian Disclosure List (1%) - Methyl chloride
Canadian WHMIS Hazard Class and Division = A., D.1.a

SARA Hazards:

Acute:	Yes	**Chronic:**	Yes
Reactive:	No	**Fire:**	No
Pressure:	No		

Additional Information

The above regulatory information represents only selected regulations and is not meant to be a complete list.

SECTION XVI - OTHER INFORMATION

NFPA Codes:

Health:	3	**Flammability:**	1
Reactivity:	0	**Other:**	N

HMIS Codes: * indicates chronic health hazard.

Health:	3*	**Flammability:**	1
Reactivity:	0	**Protection:**	X

Label Statements: Not available

Other Information:
Abbreviations:
(L) = Loose bulk density in g/ml
LOEC = Lowest observed effect concentration
MATC = Maximum acceptable toxicant concentration
NA = Not available
N/A = Not applicable
NL = Not limited
NOAEL = No observable adverse effect level
NOEC = No observed effect concentration
NOEL = No observable effect level
NR = Not rated
(P) = Packed bulk density in g/ml
PNOC = Particulates Not Otherwise Classified
PNOR = Particulates Not Otherwise Regulated
REL = Recommended exposure limit
TS = Trade secret

Additional Information

Information on this form is furnished solely for the purpose of compliance with OSHA's Hazard Communication Standard, 29CFR 1910.1200 and The Canadian Environmental Protection Act, Canada Gazette Part II, Vol. 122, No. 2 and shall not be used for any other purpose.
Revision Information:
Section III - Chronic Health Hazards
Section XI - Toxicological information
Section XIV - DOT Special Provisions, Air Special Provisions, EmS No.