



MSDS Number: 00079

Effective Date: 07/19/2006

Product Name: Brom-O-Gas®, Brom-O-Gas® 2%, Terr-O-Gas® 98, 98-2

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SECTION I - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Brom-O-Gas®, Brom-O-Gas® 2%, Terr-O-Gas® 98, 98-2
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: 07/19/2006 Supercede Date: 08/26/2003
MSDS Prepared By: Regulatory Affairs Department/Great Lakes Chemical Corporation
Synonyms: None
Product Use: EPA Registered Pesticide
Chemical Name: Methyl bromide/chloropicrin mixture
Chemical Family: Alkyl bromide; halonitroalkane

Additional Information

No information available

SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

Table with 4 columns: INGREDIENT NAME, CAS No., %, EXPOSURE LIMITS. Rows include Chloropicrin and Methyl bromide with their respective CAS numbers and exposure limits.

*Indented chemicals are components of previous ingredient.

Additional Information

Methyl bromide additional limits:
EPA Fumigation Limit = 5 ppm

Chloropicrin additional limits:
OSHA IDHL = 4 ppm
NIOSH IDHL = 2 ppm
NIOSH REL = 0.1 ppm
EPA Fumigation Limit = 0.1 ppm

SECTION III - HAZARDS IDENTIFICATION

Emergency Overview: Colorless gas at normal temperatures and pressures. Colorless liquid below boiling point of methyl bromide. Intensely irritating tear gas odor.

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SECTION III - HAZARDS IDENTIFICATION

Highly toxic. May be fatal if inhaled.
Toxic. Harmful if swallowed.
Corrosive to eyes.
Corrosive to skin.
Causes severe respiratory tract, nose and throat irritation.
May cause heart effects.
Contact can result in chemical burns.
Respiratory distress
Lung damage
Cardiac arrest

Relevant Routes of Exposure:

May cause central nervous system effects.
Ingestion, inhalation and skin absorption

Signs and Symptoms of Overexposure:

Methyl Bromide:
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.

Chloropicrin:

Chloropicrin is a powerful irritant with effects observed on all body surfaces. Liquid chloropicrin is corrosive to skin. It causes severe watering of the eyes, shortness of breath (pulmonary edema), dizziness, nausea and vomiting. Severe exposure may cause weak and irregular heartbeat, asthmatic attack and may be fatal. Skin wounds exposed to chloropicrin become septic.

Medical Conditions Generally

Aggravated By Exposure:

Dermatitis
Respiratory disorders

Potential Health Effects: See Section XI for additional information.

Eyes:

Corrosive to the eyes. May cause chemical burns.
Blurred vision
Prolonged eye exposure may result in blindness.

Skin:

Corrosive to skin. May cause chemical burns.

Ingestion:

Toxic. May be harmful if swallowed.

Inhalation:

Highly toxic. May be fatal if inhaled. May cause severe mucous membrane and respiratory tract irritation, respiratory distress, irregular heartbeat, cardiac arrest and nervous system effects.

Chronic Health Effects:

Can cause weak and irregular heartbeat.
Target organs may include the liver, kidneys, lungs, stomach, heart and skeletal muscles.

ACGIH has classified chloropicrin as an A4, Not Classifiable as a Human Carcinogen.

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

ACGIH has classified methyl bromide as an A4, Not Classifiable as a Human Carcinogen.

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.

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SECTION III - HAZARDS IDENTIFICATION

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.

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):

Unknown for mixture
For methyl bromide: ~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.

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SECTION V - FIRE FIGHTING MEASURES

Flammability Classification: Heated material decomposes violently at 112 degrees C to severely toxic gases, especially in contact with metals.
Non-flammable gas

Known or Anticipated Hazardous Products of Combustion: Hydrogen bromide and/or bromine
Hydrogen chloride and/or chlorine
Oxides of nitrogen
Phosgene
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.

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.
Persons moving or handling containers should wear protective clothing. Open container only in a well-ventilated area wearing protective clothing and respiratory protection if necessary.
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 away from direct sunlight.
Store away from heat, sparks, and flame.
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

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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 Practices of Respiratory Protection Z88.2.
Other Protective Clothing or Equipment:	Pump and detector tubes for determining methyl bromide concentrations. Measure chloropicrin concentration with a Matheson-Kitagawa detection device using tube 172.
Exposure Guidelines:	See Section II.
Work Hygienic Practices:	Wash thoroughly after handling. Make sure piping is empty before doing maintenance work. All persons working with methyl bromide/chloropicrin should be trained in the hazards, use of required respirator equipment, emergency procedures and in the proper use of methyl bromide/chloropicrin 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:	Not available (methyl bromide = 38.8 degrees F, chloropicrin = 233.6 degrees F)	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:	Not available (methyl bromide = 1.75 g/100 g of water at 68 degrees F, chloropicrin = 0.2 g/100g)
Melting Point:	Not available (chloropicrin = -83 degrees F)	Specific Gravity or Density (Water=1):	Not available

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SECTION IX - PHYSICAL & CHEMICAL PROPERTIES

Molecular/Chemical Formula:	CH3Br; CCl3NO2	Vapor Density:	Not available (methyl bromide = ~3.27, chloropicrin = ~5.7)
Molecular Weight:	NA	Vapor Pressure:	Not available (methyl bromide=1400 at 68 degrees F, chloropicrin=18.3 at 68 degrees F)
Octanol/Water Partition Coefficient:	Not available	Viscosity:	Not available
Odor:	Intensely irritating tear gas odor	Volatile Organic Compounds:	Not available
Odor Threshold:	Not available	Water/Oil Distribution Coefficient:	Not available
Particle Size:	Not available	Weight Per Gallon:	14.3 pounds

Additional Information

No information available

SECTION X - STABILITY AND REACTIVITY

Stability: Stable under normal conditions of handling and use.

Bulk containers of chloropicrin have been found to be shock sensitive.
None known

Conditions to Avoid:

Incompatibility With Other Materials:

Aluminum
Magnesium
Zinc
Alkali metals
Strong bases
Organic amines
Reducing agents
Sulfuric acid
Incompatible with containers or equipment made of aluminum, magnesium or their alloys.
Aniline
3-Bromopropyne
Propargyl bromide
Sodium methoxide
Sodium hydroxide/alcohol solutions

Hazardous Decomposition Products:

Thermal decomposition may produce the following:
Hydrogen bromide and/or bromine
Hydrogen chloride and/or chlorine
Oxides of nitrogen
Phosgene
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
150 ppm/15 minutes	Rabbit	Acute Inhalation	Chloropicrin

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SECTION XI - TOXICOLOGICAL INFORMATION

3,120 ppm/15 Minutes	Rat	Acute Inhalation	Methyl Bromide
302 ppm/8H	Rat	Acute Inhalation	Methyl Bromide
11.9 ppm/4H	Rat	Acute Inhalation	Chloropicrin
214 mg/kg	Rat	Acute Oral	Methyl Bromide
250 mg/kg	Rat	Acute Oral	Chloropicrin

Toxicological Information:

Methyl Bromide:

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.

Chloropicrin:

The inhalation LCLO for cats, rabbits and guinea pigs is 120 ppm for 20 minutes. The human TCLO is 298 ppm for 10 minutes. The oral TDLO in the mouse is 26,000 mg/kg/78 weeks.

Chloropicrin is corrosive to the skin and eyes and causes severe mucous membrane and upper respiratory tract irritation. Inhalation can cause weak and irregular heartbeat, as well as ulceration of the olfactory epithelium and necrosis of the lung tissues. Chronic stages of inhalation may produce marked necrosis of the kidney, liver and skeletal muscles.

In a two year oral chronic toxicity study in rats, at concentrations of 0.1, 1.0 and 10.0 mg/kg/day, hepatocyte vacuolation was noted at all dose levels. In the 1.0 and 10.0 mg/kg/day dose levels epithelial hyperkeratosis of the nonglandular stomach was noted in both males and females. A NOAEL was determined to be 0.1 mg/kg/day. In another 90 day oral study in rats, forestomach inflammation, necrosis, acantholysis, hyperkeratosis and ulceration were also observed. The NOAEL in this study was determined to be 8 mg/kg.

This material was mutagenic in the Ames test. In lymphocyte cells, chloropicrin was found to induce sister chromatid exchanges.

Additional Information

No information available

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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.

LC50 (96 H) Fathead Minnow = 3.72 mg/L

LC50 (96 H) Rainbow Trout = 2.87 mg/L

LC50 (96 H) Bluegill = 2.82 mg/L

Chloropicrin will decompose in the environment. The photodegradation half life is 20 days. Bioaccumulation in fish is not expected. Acutely toxic to animals, plants and aquatic organisms. Do not release to the environment.

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

AIR - ICAO OR IATA

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

WATER - IMDG

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

Additional Information

Poison Inhalation Hazard
EmS No. F-C, S-U

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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 Minimis Concentration = 1%)

Chloropicrin (De Minimis Concentration = 1%)

SARA RQ:

Methyl Bromide = 1000 lb

OSHA Highly Hazardous Chemicals::

Methyl Bromide, TQ = 2,500 lb

CERCLA Reportable Quantities:

Methyl Bromide = 1,000 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)

Massachusetts Extraordinarily Hazardous Substance (1 ppm reporting limit)

Pennsylvania Environmental Hazard List

Chloropicrin:

New Jersey Right To Know Hazardous Substance List (1% reporting limit)

Massachusetts Substance List

Pennsylvania Hazardous Substance List (1% reporting limit)

International Regulations:

This material (or each component) is listed on the following inventories:

Canada - DSL

EU - EINECS

Australia - AICS

Japan - ENCS

Korea - ECL

Philippines - PICCS

Canadian Disclosure List (0.1%) - Chloropicrin

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.

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SECTION XVI - OTHER INFORMATION

NFPA Codes:

Health: 3

Reactivity: 0

Flammability: 1

Other: N

HMIS Codes:

Health: 3*

Reactivity: 0

Flammability: 1

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

PNOR = Particulates Not Otherwise Regulated

PNOS = Particulates Not Otherwise Specified

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 Hazardous Products Act and associated Controlled Products Regulations and shall not be used for any other purpose.

Revision Information:

General review and update