

# MATERIAL SAFETY DATA SHEET



Cardinal Professional Products  
P.O. Box 782  
Hollister, CA 95024

## 1. CHEMICAL PRODUCTS AND COMPANY INFORMATION

**PRODUCT NAME:** METHYL BROMIDE 98%  
**PRODUCT CODE:** EPA REG. NO.: 8536-19  
**PRODUCT DESCRIPTION:** Methyl Bromide/Chloropicrin Soil Fumigant  
**CHEMICAL NAME:** Methyl Bromide/Chloropicrin Mixture  
**SYNONYMS:** MB 98  
**MANUFACTURER:** CARDINAL PROFESSIONAL PRODUCTS  
EPA Est. No. 8536-CA-4  
**TELEPHONE M-F, 8:00-4:30 PDT** (800) 548-2223  
**MSDS & Product Information, 8:00-4:30 PDT:** (800) 548-2223, (831) 637-0195X3024

<b>24 HOUR EMERGENCY PHONE (INFOTRAC) U.S. and CANADA:</b>	(800)-535-5053	<b>INFOTRAC (ALL OTHER AREAS):</b>	(800) 535-5053
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For information regarding **MEDICAL EMERGENCIES** or **PESTICIDE INCIDENTS**, call the **INTERNATIONAL POISON Center** at: 1-888-740-8712

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT(s)	CAS #	% by wt	EXPOSURE LIMITS
Methyl Bromide	74-83-9	98%	Y (Hazardous) 5 ppm TLV (ACGIH) 1 ppm (Skin) (ACGIH TLV TWA) C20 ppm (Skin) (OSHA PEL CEIL)
Chloropicrin	76062	2%	Y (Hazardous) 0.1 ppm (OSHA PEL TWA) 0.1 ppm (ACGIH TLV TWA) 0.1 ppm (NIOSH REL) 4 ppm (OSHA IDHL)
PEL = Permissible Exposure Limits. TLV = Threshold Limit Value.	TWA = Time Weighted Average (8 hr). STEL = Short Term Exposure Limit (15 min.).		

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## 3. HAZARDS IDENTIFICATION

### PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

#### GENERAL INFORMATION:

READ THE LABEL COMPLETELY BEFORE USING THIS PRODUCT

**DANGER – POISON - HIGHLY TOXIC**

Extremely hazardous liquid and vapor under pressure. Inhalation may be fatal or cause serious acute illness.

- 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
- May cause central nervous system effects.

#### Relevant Routes of Exposure Signs and Symptoms of Overexposure

Inhalation, skin absorption, and ingestion (unlikely)

#### **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 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 may become septic.

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**Medical Conditions**  
**Generally aggravated by**  
**Exposure**

- Dermatitis
- Respiratory disorders

**Potential Health Effects**  
**Chronic Health Effects:**

See Section 11 for additional information  
Chronic overexposure may cause neuro-toxic effects including peripheral nerve damage and central nervous system effects, respiratory effects and cardiac effects, such as weak and irregular heart beat. Target organs may include the liver, kidneys, lungs, stomach, heart and skeletal muscles.

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## 4. EMERGENCY AND FIRST AID MEASURES

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### FIRST AID PROCEDURES:

**IN ALL CASES OF OVEREXPOSURE, GET MEDICAL ATTENTION IMMEDIATELY, TAKE PERSON TO A DOCTOR OR TO AN EMERGENCY TREATMENT FACILITY.**

**IF INHALED:** Get exposed person to fresh air. Keep warm. Make sure person can breathe freely. If breathing has stopped, give artificial respiration. Give oxygen if needed. Do not give anything by mouth to an unconscious person. Seek medical attention.

**IF INGESTED** Harmful if swallowed. Seek medical attention.

**IF IN EYES:** Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes.

**IF ON SKIN:** Immediately remove contaminated clothing, shoes, and other items covering the skin. Air them outside. Wash contaminated skin area thoroughly with soap and water.

### NOTE TO PHYSICIAN:

Early symptoms of overexposure are dizziness, headache, nausea and vomiting, weakness, and collapse. Lung edema may develop in 2 to 48 hours after exposure, accompanied by cardiac irregularities; these effects are the usual cause of death. Repeated overexposure can result in blurred vision, staggering gait and mental imbalance, with probable recovery after a period of no exposure. Blood bromide levels suggest the occurrence, but not the degree, of exposure. Treatment is symptomatic.

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## 5. FIRE FIGHTING MEASURES

### FLAMMABLE PROPERTIES

**FLAMMABILITY CLASSIFICATION:** Non-flammable gas

**FLASH POINT:** None

**FLAMMABLE LIMITS IN AIR (% by volume):** There is no danger of fire or explosion in fumigation use concentrations.

**LOWER FLAMMABLE LIMIT:** (At S.T.P.) LeI 10%, with an intense electric spark-high ignition source

**UPPER FLAMMABLE LIMIT:** (At S.T.P.) LeI 15% with an intense electric spark-high ignition source

**AUTOIGNITION TEMPERATURE:** Not applicable

**SENSITIVE STATIC DISCHARGE:** Not applicable

**HAZARDOUS COMBUSTION PRODUCTS:** Non-flammable in concentrated form. Under fire conditions methyl bromide decomposes into hydrogen bromide, bromine, carbon monoxide and carbon dioxide. Chloropicrin decomposes into hydrochloric acid and/or chlorine, phosgene, and oxides of nitrogen.

**EXTINGUISHING MEDIA:** All conventional media are suitable.

**FIRE FIGHTING INSTRUCTIONS:** Wear self-contained breathing apparatus and protective clothing to protect from skin and eye contact in fire situations. Work from safe, protected position. Cool cylinders with water. Cylinders may rupture violently and release toxic gas due to over pressure when exposed to temperatures in excess of 347°F/ 175°C.

## 6. ACCIDENTAL RELEASE MEASURES:

### STEPS TO BE TAKEN IN CASE MATERIAL IS LEAKED OR SPILLED

Evacuate the immediate area of the spill or leak. Use SCBA or combination air-supplied respirator for entry into the affected area to correct problem. Move leaking or damaged cylinders or containers outdoors or to an isolated location, observing strict safety precautions. Work up wind if possible. Allow spill to evaporate. Do not permit entry into spill area by unprotected persons until the

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concentration of methyl bromide is determined to be less than 5 ppm (20 mg/cu.m).

## PERSONAL PRECAUTIONS

See Section 8

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## 7. HANDLING AND STORAGE

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### GENERAL PROCEDURES: OBSERVE THE FOLLOWING PRECAUTIONS HANDLING:

1. Do not discharge contents outside of areas confined for treatment.
2. Comply with all local regulations and ordinances.
3. It is advisable to supply your physician with information on Methyl Bromide. Literature is available from your dealer or distributor.

### STORAGE AND DISPOSAL:

Store in a secure manner either outdoors under ambient conditions or indoors in a well-ventilated area. Post as a pesticide storage area. Do not contaminate water, food or feed by storage. Store cylinders upright, secured to a rack or wall to prevent tipping. 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 tightly, screw safety cap onto valve outlet, and replace protection bonnet before returning to shipper. Only the registrant is authorized to refill cylinders. Do not use cylinders for any other purpose.

### RETURN CYLINDERS TO:

Cardinal Professional Products  
8770 Highway 25  
Hollister, CA 95023  
or  
Niklor Chemical Company  
1667 Purdy Avenue  
Mojave, CA 93501

Cylinders are the property of Cardinal Professional Products and should be returned promptly by collect auto freight. Do

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not ship cylinders without safety caps or valve protection bonnets. When a cylinder is partially full and there is no further requirement for the product, contact the company for return instructions.

## WORK HYGIENIC PRACTICES:

1. 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 as a fumigant where applicable.
2. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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### EXPOSURE LIMITS:

#### Air Concentration Level

The acceptable air concentration level for persons exposed to methyl bromide is 5 ppm (20 mg/m<sup>3</sup>). The air concentration level is measured by a direct reading detection device, such as a Dräger tube/pump.

### ENGINEERING CONTROLS:

Sufficient to reduce concentration to TLV.

Local Exhaust: From point of origin of fumes.

General: Provide exhaust from inside of building.

### RESPIRATORY PROTECTION:

A respirator is required if the air concentration level of 5 ppm for Methyl Bromide is exceeded at any time. The respirator must be one of the following types: (a) a supplied-air respirator (MSHA/NIOSH approval number prefix TC-19C) or (b) a self-contained breathing apparatus (SCBA (MSHA/NIOSH approval number prefix TC-13F).

### SKIN PROTECTION:

#### Applicators and other handlers must wear:

1. Loose-fitting or well ventilated long-sleeved shirt and long pants or equivalent, e.g., a one piece garment
2. Full-face shield or safety glasses with brow and temple shields when handling liquid product (Do NOT wear goggles.)
3. Do not wear jewelry, gloves, tight clothing, rubber protective clothing, or rubber boots when handling. Methyl bromide is heavier than air and can be trapped inside clothing and cause skin injury.
4. If liquid fumigant splashes or spills on clothing, shoes or socks remove them at once. Keep clothing and shoes outdoors and do not reuse them until thoroughly

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aerated

5. Heavily drenched clothing, shoes or socks and any absorbent materials should be discarded. Do not reuse them.
6. Follow the PPE manufacturer's instructions for cleaning/maintaining PPE. If there are no such instructions for washables, use detergent and hot water. Keep and wash PPE and work clothing separately from other laundry.
7. Follow PPE manufacturer's instructions for cleaning/maintaining respirators.

## EYE PROTECTION:

Full-face shield or safety glasses with brow and temple shields when handling liquid product (Do NOT wear goggles.)

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>MOLECULAR FORMULA:</b>	CH <sub>3</sub> Br:CCl <sub>3</sub> NO <sub>2</sub>
<b>MOLECULAR WEIGHT:</b>	Not available
<b>WEIGHT PER GALLON:</b>	14.3 lbs
<b>APPEARANCE:</b>	Colorless gas at normal temperatures and pressure. Colorless liquid below boiling point of methyl bromide
<b>ODOR:</b>	Intensely irritating tear gas odor
<b>PHYSICAL STATE:</b>	Liquid below 38.4°F/3°C, gaseous above this temperature
<b>VAPOR PRESSURE:</b>	Not available (methyl bromide = 1400 mm Hg @ 68°F/20°C) (chloropicrin = 18.3 @ 68°F)
<b>VOC:</b>	Not available
<b>VAPOR DENSITY:</b>	Not available (methyl bromide = ~3.27) (chloropicrin = ~5.7)
<b>BOILING POINT:</b>	Not available (methyl bromide = 38.4°F/3°C) (chloropicrin = 233.6°F)
<b>SOLUBILITY IN WATER:</b>	Not available (methyl bromide = 1.34 gms/100ml @ 77°F/25°C) (chloropicrin = 0.2g/100g)
<b>SOLUBILITY IN OIL:</b>	Not available
<b>SPECIFIC GRAVITY:</b>	Not available (methyl bromide = 1.732 @ 32°F/0°C (H <sub>2</sub> O = 1)) (chloropicrin = 1.65 @ 20°C)

## 10. STABILITY AND REACTIVITY

### CHEMICAL STABILITY:

Stable under normal conditions of handling and use

### CONDITIONS TO AVOID:

Containers may rupture in fire conditions.  
Alkali Metals

### INCOMPATIBILITY:

- Liquid methyl bromide reacts with aluminum, magnesium, zinc, or alloys of aluminum and magnesium, or zinc coated steel. Unstable decomposition products formed may ignite

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spontaneously in the presence of oxygen.

- Aniline
- 3-Bromopropyne
- Propargyl bromide
- Sodium methoxide
- Sodium hydroxide/alcohol solutions

## HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition may produce hydrogen bromide, and/or bromine, carbon monoxide, carbon dioxide, hydrogen chloride, oxides of nitrogen, and Phosgene

## HAZARDOUS POLYMERIZATION:

Will not occur.

## 11. TOXICOLOGICAL INFORMATION

VALUE (LD50 OR LC50)	ANIMAL	ROUTES	COMPONENTS
150 ppm /15 minutes	Rabbit	Acute Inhalation	Chloropicrin
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

### 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

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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 B6C3F1 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.

## CARCINOGENICITY:

<b>NPT:</b>	No	<b>ACGIH:</b>	No
<b>IARC:</b>	No	<b>OTHER:</b>	No
<b>OSHA:</b>	No		

**CHRONIC** 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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## 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 market 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 8mg/kg.

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

## 12. ECOLOGICAL INFORMATION

### ECOTOXICOLOGICAL INFORMATION:

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.

This product is toxic to fish and wildlife.

### 13. DISPOSAL CONSIDERATIONS:

Pesticide wastes are toxic. Improper disposal of excess pesticide is a violation of Federal law. Unused fumigant should be returned as in section 7. If there are any questions regarding disposal, contact Cardinal.

## 14. TRANSPORT INFORMATION

### U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION:

#### PROPER SHIPPING NAME:

Methyl Bromide  
Poison-Inhalation Hazard, Hazard Zone C, ERG #123

#### HAZARD CLASS:

2.3

#### IDENTIFICATION NUMBER (UN or NA):

UN 1062

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<b>PACKING GROUP:</b>	N/A
<b>SPECIAL PROVISIONS</b>	3, B14, T50
<b>NON-BULK PACKAGING</b>	193
<b>BULK PACKAGING:</b>	314, 315
<b>PASSENGER AIR/RAIL LIMIT:</b>	Forbidden
<b>AIR CARGO LIMIT:</b>	25 kg
<b>OTHER STORAGE</b>	40
<b>VESSEL STOWAGE:</b>	D

**ADDITIONAL INFORMATION:** Placard: Poison Inhalation  
 Hazard-2 (when required)

## 15. 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%)  
 Chloropicrin (De Minimus Concentration = 1%)

### SARA Hazards:

<b>IMMEDIATE (ACUTE HEALTH HAZARD)</b>	<b>YES</b>				<b>FIRE HAZARD</b>	<b>NO</b>
<b>CHRONIC OR DELAYED HEALTH HAZARD</b>	<b>YES</b>				<b>REACTIVE HAZARD</b>	<b>NO</b>
					<b>SUDDEN PRESSURE GENERATING HAZARD</b>	<b>NO</b>

### CERCLA RQ

**Methyl Bromide** 1000 lbs

### OSHA Highly Hazardous Chemicals:

**Methyl Bromide, TQ = 2,500 lbs**

### STATE REGULATIONS:

- Methyl Bromide:
- California: VOC-Not Applicable

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- New Jersey Right To Know Hazardous Substance List (1% reporting limit).
- Pennsylvania Environmental Hazard List
- Massachusetts Extraordinarily Hazardous Substance (1ppm reporting limit)
- Methyl bromide is listed as a reproductive toxin for structural fumigation uses by California. Acceptable intake level is 1000 ug/day.

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

Canadian Disclosure List (1%) – Methyl chloride

Canadian WHMIS Hazard Class and Division = A., D.1.a

## ADDITIONAL INFORMATION

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

## 16. OTHER INFORMATION

### HMIS RATINGS:

We assign HMIS ratings to this product based on the hazards of its ingredients(s). Since the customer is most aware of the applications and conditions of use, he must ensure that the proper personal protective equipment is provided consistent with information contained in Section's 7 and 8 of this MSDS.

<b>HMIS RATINGS:</b>	Health	3 (Indicates chronic health hazard)
	Flammability	1
	Reactivity	0

*The data contained herein is based on information currently available to Cardinal Professional Products, and believed to be factual and the opinions expressed to be those of qualified experts; however, this data is not to be taken as a warranty or representation for which Cardinal Professional Products assumes legal responsibility.*

Material Safety Data Sheet prepared by Cardinal Regulatory Affairs Group