RESTRICTED USE PESTICIDE
DUE TO ACUTE TOXICITY

For retail sale to and use only by Certified Applicators or person under their direct supervision, and only for those uses covered by the Certified Applicator's certification

DIRECTIONS FOR USE OF THE PRODUCT

METH-O-GAS® 100

COMMODITY FUMIGANT

EPA REGISTRATION NUMBER

5785-11

DANGER PELIGRO

Si Usted no entiende la etiqueta, busque a alguien para que se la explique a Usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

READ THIS BOOKLET AND ENTIRE LABEL CAREFULLY PRIOR TO USE. USE THIS PRODUCT ACCORDING TO LABEL INSTRUCTIONS.

Great Lakes
Chemical Corporation
P.O. Box 2200, West Lafayette, Indiana 47906

MOG100-10 REV GLK 159E

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STATEMENT OF WARRANTY AND LIABILITY

Seller warrants that this product complies with the specifications expressed in this label. SELLER MAKES NO OTHER WARRANTIES; AND DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE INTENDED PURPOSE. Seller's liability for default, breach, or failure under this label shall be limited to the amount of the purchase price. Seller shall have no liability for consequential damages.

Many pesticidal chemicals are poisonous and may leave a toxic residue on the plants to which they are applied. The U.S. Environmental Protection Agency has established maximum amounts of such pesticidal chemicals that may remain on raw agricultural products, and it is the user's responsibility to see that there is no residue on such crops in excess of these amounts. The "Directions for Use" are based on the best available information, and if followed carefully should not leave excessive residues. However, Great Lakes Chemical Corporation assumes no responsibility as to their accuracy nor for any loss due to excessive residues.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS

DANGER

Extremely hazardous liquid and vapor under pressure. 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.

Do not breathe vapor. Inhalation may be fatal or cause serious acute illness or delayed lung or nervous system injury. Methyl bromide vapor is odorless and nonirritating to skin and eyes during exposure. Exposure to toxic levels may occur without warning or detection by the user.

AIR CONCENTRATION LEVEL

The acceptable air concentration level for persons exposed to methyl bromide is **5 ppm (20 mg/m3).** The air concentration level is measured by a direct reading detection device, such as a Matheson-Kitagawa, Draeger, or Sensidyne.

AERATION AND REENTRY

After fumigation, treated areas must be aerated until the level of methyl bromide is **5 ppm** or less. Do not allow entry into the treated area by any person before this time, unless protective clothing and a respiratory protection device (NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator) is worn.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:
Loose-fitting or well ventilated long-sleeved shirt and long pants.
Shoes and socks.
Full-face shield or safety glasses with brow and temple shields (Do NOT wear goggles).
When the acceptable air concentration level is above **5 ppm** and a respirator is required, protect the eyes by wearing a full-face respirator.

No respirator is required if the air concentration level of methyl bromide in the working area is measured to be **5 ppm** or less.

A respirator is required if the acceptable air concentration level of **5 ppm** 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).

WORK SAFETY REQUIREMENTS

1. Do not wear jewelry, gloves, goggles, 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.
2. If liquid fumigant splashes or spills on clothing or shoes, remove them at once.
3. Immediately after contamination remove outer clothing, shoes, and socks and do not reuse until thoroughly aerated or ventilated. Keep such clothing and shoes outdoors until thoroughly aerated. Then follow the PPE manufacturers 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.
4. Discard clothing, shoes and other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them.
5. Follow PPE manufacturer's instructions for cleaning/maintaining protective eyewear and respirators.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

STATEMENT OF PRACTICAL TREATMENT 4

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, apply artificial respiration. If not unconscious, rinse mouth out with water. Do not give anything by mouth to an unconscious person.

IF ON SKIN: Immediately remove contaminated clothing, shoes, and any other item on skin, Wash contaminated skin area thoroughly with soap and water.

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

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 overexposures 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.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Keep out of lakes, streams and ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

SPILL AND LEAK PROCEDURES. 5

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. 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 **5 ppm** or less, Remove leaking containers to an isolated area and cover with a polyethylene sheeting of 4 mil or greater thickness. Seal by placing the outside edges of sheeting in a trench and cover with soil. Tamp soil down so edges will not pull loose. Discharge the contents under the sheeting and do not disturb for at least 48 hours.

Contaminated soil, water, and other cleanup debris is a toxic hazardous waste. Report spill to the National Response Center (800-424-8802) if the reportable quantity of 1000 pounds is exceeded.

PHYSICAL AND CHEMICAL HAZARDS

Contents under pressure. Do not use or store near heat or open flame. In fires fueled by other materials, Meth-O-Gas® 100 may liberate hazardous gases. Meth-O-Gas® 100, used as a gaseous fumigant, is generally non-corrosive under dry conditions. However, the use of liquid methyl bromide with aluminum, magnesium, zinc and alkali metals may result in the liberation of toxic gases, and possible fire and explosion. In addition, the use of liquid methyl bromide may cause severe corrosion of containers and equipment made of these metals.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

This fumigant is a highly hazardous material and must be used only by individuals trained in its proper use. Before using, you must read and obey all label precautions and directions.

All persons working with this fumigant must be knowledgeable about the hazards, and trained in the use of required respiratory protection equipment and detector devices, emergency procedures, and proper use of the fumigant.

STORAGE, HANDLING AND DISPOSAL 6

Storage and Handling of Cylinders. 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 prevent tipping, as allowed by design.

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 on to valve outlet, and replace protection bonnet before returning. Only the registrant, or his designee, is authorized to refill cylinders. Do not use cylinders for any other purpose.

Storage and Handling of Cans. Store 1 and 1.5 pound cans indoors in a locked, dry, well-ventilated area. Do not attempt to store partially emptied cans. Keep empty cans in a well-ventilated location for at least 12 hours before disposal. Do not reuse empty cans.

Disposal of Pesticide. Pesticide wastes are toxic. Improper disposal of excess pesticide 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.

Disposal of Cylinders. To insure proper return of empty or partial cylinders, make return shipping arrangements with the seller of the product.

Disposal of Cans. Before disposal, empty the can by using the product according to the label. Keep empty cans in a well-ventilated location for at least 12 hours before disposal. Cans can be recycled in some recycling centers. Otherwise, dispose of empty cans in a sanitary landfill, or by other procedures approved by state and local authorities.

COMMODITY, FOOD, AND FEED FUMIGATION DIRECTIONS. 7

THE FOLLOWING PRECAUTIONARY PROCEDURES MUST BE FOLLOWED FOR ALL USES.

When used for fumigation of enclosed spaces (e.g., warehouses, grain bins or elevators, vaults, chambers, trucks, vans, railroad cars, ships, and other transport vehicles, and tarpaulin-covered commodities), two persons trained in the use of this product must be present during introduction of the fumigant, initiation of aeration, and after aeration when testing for reentry. Two persons do not need to be present if application, aeration, monitoring and/or testing is conducted remotely (outside the area being fumigated).

Do not fumigate with this product when the space, commodity, or structure (excluding dwellings) to be fumigated is below 40°F for control of insects or below 20°F for control of rodents and other warm-blooded pests.

If monitoring indicates concentration of fumigant is insufficient to be effective for the target pest, additional fumigant may be added as required; but, concentration is not to exceed prescribed rates of application.

When fumigating tanks, silos, etc., of stored bulk flour, empty or draw down flour to less than one meter deep. Do not introduce liquid methyl bromide into flour storages. Set up fans or air circulation to avoid localized high concentrations of methyl bromide when shooting gaseous methyl bromide into the storage. Do not overdose flour storages. It is recommended that the fumigant be applied outside flour storages that are inside buildings and allowed to drift in through open hatches.

PLACARDING OF FUMIGATED AREAS

The applicator (or supervisor of the application) must placard all entrances to the fumigated area with signs bearing:

- skull and crossbones symbol.
- "DANGER/PELIGRO,"
- “Area under fumigation, DO NOT ENTER/NO ENTRE,”
- “Methyl Bromide Fumigant in use,”
- the date and time of fumigation, and
- name, address, and telephone number of the applicator.

Do not allow entry by unprotected persons into the fumigated area until the signs are removed. Do not remove warning signs until the fumigated area and the treated commodity are completely aerated. To determine whether aeration is complete, each fumigated site or vehicle must be tested and shown to contain **5 ppm** or less of methyl bromide in the airspace around and, when feasible, in the mass of the commodity. If **5 ppm** or less of methyl bromide is detected, the warning sign may be removed. However, if greater than **5 ppm** of methyl bromide is detected, the warning signs must be transferred with the commodity to the new site. Workers who transfer or handle incompletely aerated commodity must be informed and appropriate measures must be taken (i.e. ventilation or respiratory protection) to prevent exposures from exceeding **5 ppm** of methyl bromide.

A. **Chamber and Vault Fumigation.** 8

All precautionary procedures as outlined immediately following COMMODITY, FOOD, AND FEED FUMIGATION DIRECTIONS must be followed.

Load the chamber with the material to be fumigated, close exhaust ports, turn on circulating fan and close chamber door. Determine the proper rate of application and exposure time from appropriate table. Introduce the fumigant into the chamber by releasing it into the air stream in front of a blower or fan, passing it through a vaporizer, or allowing it to evaporate from a shallow pan. All controls should be outside the chamber.

At the end of the exposure period, aerate by opening the exhaust port, turning on the exhaust fan and opening the chamber door slightly or an inlet port to permit fresh air to enter. At the end of the aeration period, check fumigant concentration with a detection device. See Aeration and Reentry Section.

B. **Vacuum Chamber Fumigation.** 9

All precautionary procedures as outlined immediately following COMMODITY, FOOD, AND FEED FUMIGATION DIRECTIONS, must be followed.

Place articles to be fumigated in the steel chamber and draw the vacuum (25-27 inches mercury). Release fumigant into the chamber (usually through an appropriate heating unit to insure complete non-destructive vaporization of methyl bromide). See appropriate table for rates of application and exposure times, At the end of the exposure time, release the vacuum and change the air in the chamber at least two times. A vacuum of 15 inches mercury should be drawn for this purpose. After purging chamber, check fumigant concentration with a detection device. See Aeration and Reentry Section.

C. Railroad Car, Truck, Van, Trailer or Air and Sea Container Fumigation. 10

All precautionary procedures as outlined immediately following COMMODITY, FOOD, AND FEED FUMIGATION DIRECTIONS, must be followed.

Railroad car should be placed on seldom used trackage or siding so that it will not have to be moved while under fumigation. Park vehicle or container out of traffic area; if possible on the lee side of a building to protect from winds. Do not fumigate while strong winds are blowing. Seal the doors, ventilators and other openings. If vehicle or container can not be adequately sealed, cover with tarpaulin or Plastic sheeting. See Tarpaulin Fumigation Section.

The end(s) of the shooting line(s) should be anchored inside an evaporation pan unless a volatizer is used to apply gaseous fumigant. Use a fan or blower to aid in even distribution of the fumigant. Always apply fumigant from outside the vehicle. Place warning signs on doors and as needed to be easily visible. Secure or lock vehicle or container to ensure it is not moved before aeration. **DO NOT FUMIGATE VEHICLES IN TRANSIT.**

Consult appropriate table for specific articles, rates of application and exposure times.

After the appropriate exposure period, open the unit and aerate at least one hour. The vehicle must be aerated to **5 ppm** or less before movement is allowed. The vehicle may then be resealed for shipment. See Aeration and Reentry Section.

D. **Tarpaulin Fumigation.** 11

All precautionary procedures as outlined immediately following COMMODITY, FOOD, AND FEED FUMIGATION DIRECTIONS, must be followed.

The article or stacked articles should be placed on a concrete floor or other air-tight surface. If the floor or surface is not air-tight, it may be made so by sealing or covering it with additional tarpaulin or polyethylene sheeting. Provide a space on top of the stack for a gas expansion dome to facilitate distribution. Evaporating pans are essential for the volatilization and uniform dispersion of fumigant except where a vaporizer is used. Shallow pans or basins made of plastic or metal (except aluminum) are satisfactory for this purpose. Use one evaporator pan for each 1000 cubic feet contained under the tarp. For delivery of Meth-O-Gas® 100 from outside the tarpaulin, do not use polyvinyl tubing; polyethylene tubing is recommended. Anchor one end of each tube into an evaporating pan with tape or a suitable weight. This ensures that the liquid will be directed into the evaporating pan. Place evaporating pan(s) with anchored applicator tubing in the center of the expansion dome. Extend the free ends of the polyethylene tubes outside the area to be covered. Cover and seal the stack with a gas tight tarpaulin or polyethylene sheeting of 4 mil or greater thickness. Allow a margin of at least two feet at the base of the stack for sealing. Sweep around the stack to provide a clean surface for sealing the tarpaulin. Seal tarpaulin to floor by sand and/or water snakes, by taping or by means of moist soil or sand.

Attach each polyethylene tube to a can applicator or cylinder valve outlet and release fumigant. Use a cylinder dispenser or scale to meter small amounts from cylinders. Special units are available for use of 1 and 1.5 pound cans that combine opener and evaporating pan functions, and are designed to be used with all parts under the tarpaulin. Fans normally should be used in tarp fumigations to aid in the even distribution of fumigant. A vaporizer or heat exchanger may be required and is also useful to aid in application and distribution of the fumigant. Dosage rates and exposure times are shown in Tables I through IV. At the end of the exposure period, unseal opposite ends of the tarpaulin and allow to aerate for at least one hour before completely removing the tarp. Check fumigant concentration with a detection device before allowing unprotected persons to enter the area. See Aeration and Reentry Section.

E. **Warehouse, Grain Elevator, Food Processing Plant, Restaurant, And Other Structures Containing Commodities.**

All precautionary procedures as outlined immediately following COMMODITY, FOOD, AND FEED@ FUMIGATION DIRECTIONS, must be followed.

Check with appropriate municipal and county authorities before fumigating to be completely familiar with local regulations. Ordinances may require watchmen or locks, during fumigation and/or notification of the nearest fire station.

1. **Preparation for Fumigation.** Remove or protect the following items from the structure to be fumigated: 1) all food and feed commodities not included in Tables I or II; 2) medicinals not sealed in metal or glass; 3) pets (including fish and birds); 4) furs, horsehair articles, and leather goods

sensitive to methyl bromide; 5) rubber goods (natural latex); 6) carbonless carbon forms and blueprints; 7) cinder blocks; 8) articles containing sulfur; 9) seeds, bulbs, and live plants; 10) live cultures.

Prior to fumigation, extinguish all open flames and turn off all high temperature electrical equipment including laboratory ovens, pilot lights, gas refrigerators, oil burners, etc. Meth-O-Gas® 100 in the presence of intense heat from such sources may generate some hydrobromic acid which may be injurious to commodities and equipment.

2. **Sealing the Building.** The most important part of the fumigation is the preparation and sealing of the structure. A thorough sealing job is necessary. Avoid fumigating under windy conditions.

   Sealing of the building begins with the closing of all external openings to the building. Wrap roof ventilators, chimneys and other large openings with a tarpaulin or plastic sheet and seal with duct or other appropriate tape. Screened and small openings may also be sealed with a wide, commercial duct or masking tape. Cleaning of the surfaces to be taped and the use of commercial spray-on adhesives will improve sealing.

   For masonry or metal structures, seal all cracks and other air leaks with caulking material or tape, and seal cracks around doors, windows, vents and other openings. Wooden structures and others that can not be readily sealed may be completely enveloped with an impervious tarpaulin. Seal securely all seams between tarps and seal the lower edges of the tarp to the ground with moist soil or with sand or water snakes. To prevent escape of gas through the ground and avoid injury to nearby plants, wet the soil to a depth of six inches for a distance of one foot outward from the edge of the tarp.

   Exterior doors and windows should be tightly sealed and locked. Large exterior doors may require additional efforts to seal properly. Check for cracks around the eaves, in the floor and roof, and seal them.

   Storage or work areas in a building that are not to be fumigated should be carefully sealed off. Adjoining buildings sharing a common wall should be cleared of occupants before fumigation. If this is not feasible, seal with a gas tight tarp or polyethylene sheeting (thickness of 4 ml or greater) to prevent spread of the fumigant to undesirable areas. In all such cases where the adjoining building is occupied, it should be checked frequently with a suitable gas detector during fumigation to ensure the safety of the occupants. Check local regulations for specific requirements.

   Doors or hatches on milling machinery should be opened prior to fumigation. These include elevator boots, conveyor lids, settling chamber doors, dust trunks, and any other openings that will allow fumigant into the equipment. Inside doors, openings to attics and crawlspaces, cabinets, lockers, and drawers should also be opened to facilitate treatment and aeration. “Dead” spouts are particularly difficult to penetrate and should be opened before the fumigation.

   Set up fumigant application equipment and fans as necessary to achieve uniform fumigant concentrations and to facilitate thorough aeration after the exposure period. The choice of a fan or fans depends upon fan capability to perform the desired function without jeopardizing the success of the fumigation. Small battery operated fans may be suitable in very small situations. A fan with tubing attached may be useful for internal recirculation of the fumigant within a building or space to aid in reaching and maintaining equalized concentrations. Adequate fans should also be available to effectively aerate difficult to ventilate situations because of construction or unexpected wind direction or calm. It may be possible to use heating system fans or other installations already in a building for improved circulation or distribution of Meth-O-Gas® 100, as well as aid in ventilation after the exposure period. All fans used for the fumigation should be running when fumigant is being introduced, and left running until uniform distribution has been accomplished. Fumigators should not enter a space or building under fumigation to turn fans off or on.

See appropriate table for rate of application and exposure times.

3. **Fumigating the Structure.** Inside Release. Cylinders should be placed by a team of two people and the location of each cylinder in the building should be mapped. The cylinders should be arranged so that the fumigators can walk away from the released gas as they open each subsequent cylinder. It is recommended that polyethylene sheeting or something functionally similar be used underneath cylinders and at the point of release to prevent staining or damage to floor surfaces. Narrow cylinders should be secured to prevent tipping.

   Cylinders should be placed within a room for best distribution into all areas. Cylinders should be placed in a normal upright position and the shipping caps removed. Standpipes or curved pipes directed up and away from the cylinder can be attached. Polyethylene, nylon or similar tubing, possibly divided with tees or crosses, or other equipment can also be attached to facilitate distribution of the gas within the room or space to be fumigated.

   Place warning signs or placards on all entrances to the building. Signs and placards should conform to all local, state, and federal regulations. It is best to inform police, fire and health officials that a fumigation process is about to begin. Observe the location of the nearest outside telephone for use in case of an emergency.

   Practice or review the shooting procedure so that the operation will be done efficiently and safely. Respiratory protection equipment should be checked for leaks and other problems before the "practice session". While wearing respiratory protection, quickly open and close the cylinder valves to make certain they are in working order and thus avoid delay during the actual release.

   Applicators should not be in the building longer than 30 minutes while releasing the gas. If it is impossible for one team to do it within this time period, additional experienced teams should be used. Two people should work together while the gas is being released and when entering the structure during aerating and testing.

   Fumigators should always remain in sight of each other from the time they open the first cylinder until the time they leave the building together. While the fumigant is being released, it is advisable to have additional people, with respiratory protection equipment ready, waiting outside to assist if necessary. One member of the team should record the release of the fumigant from each cylinder so that none are missed. After making sure fumigation area is vacated, immediately lock and seal the last exit. If guards are used, they should remain on duty during release, exposure, and aeration periods to prevent unauthorized entry.

4. **Fumigating the Structure.** Outside Release. Releasing the fumigant from outside the space to be fumigated is possible in some situations and can minimize applicator exposure to the fumigant. Prepare the building as outlined previously.

   Secure the ends of each "shooting" line or hose to each point where the fumigant is to be released, using evaporating pans or plastic sheeting to prevent possible damage to some surfaces. Run each line to the cylinder(s) or manifold located outside the area to be treated. Connect each line to the cylinder(s) or manifold.

   When fumigating storages of bulk grain or other bulk commodities, such as silos, grain bins, tanks, etc., the fumigator should plan sealing and fumigant distribution to effectively fumigate all the target pests contained in the sealed space. The fumigant can be applied in several locations such as the top and bottom of the storage. For bulk commodities more than 20 feet deep, a permanent or temporary fumigant recirculation system should be considered. When recirculating fumigant through a closed loop system, plan to run fans long enough to achieve at least three complete cycles.

After making sure fumigation area is vacated, immediately lock and seal the last exit. If guards are used, they should remain on duty during release, exposure, and aeration periods to prevent unauthorized entry.

Open the valves to release the fumigant. Respiratory equipment must be available in the event of a major leak or equipment failure.

5. **Aerating the Building.** When the exposure period is complete, aeration generally should be started by opening previously sealed doors and windows on the ground floor. Ventilators accessible from the outside should be opened at this time.

   After partial aeration, a team of at least two trained people with appropriate respiratory protection, should begin opening windows or remaining sealed openings, starting at the lower floors and working upward. Fans should be on to assist aeration. Aeration is usually complete in four hours depending upon weather conditions and cross ventilation. No one should be allowed inside the building without respiratory protection until the methyl bromide concentration is **5 ppm** or less in the worker areas.

   Contact the police, fire and health officials previously notified of the fumigation and inform them that it has been completed.

F. **Shipboard, In Transit Ship or Shiphold Fumigation.** 13

IMPORTANT. Shipboard, in transit ship or shiphold fumigation is also governed by the U.S. Coast Guard Regulations. Refer to and comply with those regulations prior to fumigation.

Prior to fumigating a vessel for in transit cargo fumigation, the master of the vessel or his representative and the fumigator must determine whether the vessel is suitably designed and configured so as to allow for safe occupancy by the ship's crew throughout the duration of the fumigation. If it is determined that the design and configuration of the vessel does not allow for safe occupancy by the ship's crew throughout the duration of the fumigation, then the vessel must not be fumigated unless all crew members are removed from the vessel. The crew members must not be allowed to reoccupy the vessel until the vessel has been properly aerated and a determination has been made by the master of the vessel and the fumigator that the vessel is safe for occupancy **(5 ppm** or below).

The person responsible for the fumigation must notify the master of the vessel or his representative of the requirements: 1) relating to the use of respiratory protection equipment; 2) relating to the use of detection equipment; and 3) that a person qualified in the use of this equipment must accompany the vessel with cargo under fumigation. Emergency procedures, cargo ventilation, periodic monitoring and inspections, and first aid measures must be discussed with and understood by the master of the vessel or his representative.

During fumigation, or until a manned vessel leaves port or the cargo is aerated, the person in charge of the fumigation shall ensure that a qualified person using gas detection equipment tests spaces for fumigant leakage. If leakage of the fumigant is detected, the person in charge of the fumigation shall take action to correct the leakage, or inform the master of the vessel, or his representative, of the leakage so that corrective action can be taken.

Using appropriate gas detection equipment, monitor spaces adjacent to areas containing fumigated cargo and all regularly occupied areas for fumigant leakage. If leakage above **5 ppm** is detected, the area should be evacuated of all personnel, ventilated, and action taken to correct the leakage, before allowing the area to be reoccupied. Do not enter fumigated areas except under emergency conditions. If necessary to enter a fumigated area, wear a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator (personal protection equipment). Never enter

fumigated area alone. At least one other person, wearing personal protection equipment, should be available to assist in case of an emergency.

If necessary to enter holds prior to discharge, test spaces directly above cargo surface for fumigant concentration, using an appropriate gas detector and while wearing personal protection equipment. Do not enter without respiratory protection, unless fumigation concentrations are at or below **5 ppm,** as indicated by a suitable detector.

If the fumigation is not completed and the vessel aerated before the manned vessel leaves port, the person in charge of the vessel shall ensure that there be on board the vessel during the voyage: 1) at least two NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirators; 2) one gas detection device; and 3) a person qualified in their operation.

Fumigation of any ship, shiphold, or a portion of the vessel (e.g., galley) requires careful planning. All precautionary procedures as outlined previously must be followed. Aeration should be planned so that it can be safely and effectively conducted. Adequate supplemental fans to ventilate quarters, decks, bottom of shipholds, etc., should be available for use. Tubing attached to fans or used as a temporary exhaust stack for aeration should also be prepared in advance. Recirculation systems for fumigation of grain and other commodities in shipholds must be installed before loading.

The master of the vessel or his representative and the fumigator should discuss security of an unoccupied vessel under fumigation and make arrangements to prevent unauthorized boarding. If a crew member will need to board such a vessel for a necessary ship function (e.g., boiler check) the crew member must be trained in the proper use of respiratory protection equipment. The fumigator should test all passageways and areas where the crew member will be entering to determine if fumigant concentrations exceed **5 ppm** in the air. If concentrations exceed **5 ppm,** then required respiratory equipment must be worn.

See appropriate table for rates of application and exposure times.

TABLE I
APPLICATION SUMMARY
METH-O-GAS® 100

FOR STORED PRODUCTS PESTS INFESTING RAW AGRICULTURAL COMMODITIES
(NOT PROCESSED FOOD)

COMMODITY	INSECTS CONTROLLED	TOLERANCE (ppm)	DOSAGE (lb/1000 ft^3)	EXPOSURE TIME (HRS)
Almonds	confused flour beetle, saw toothed grain beetle, dermestids, Indian meal moth, rice weevil, khapra beetle, drugstore beetle, cigarette beetle, warehouse moth, rusty grain beetle, cadelle, groundnut bruchid, pecan weevil	200	3.5	24
Brazil Nuts		200	3.5	24
Bushnuts		200	3.5	24
Butternuts		200	3.5	24
Cashews		200	3.5	24
Chestnuts		200	6	6
Chestnuts		200	3.5	24
Filbetts		200	3.5	24
Hickory Nuts		200	3.5	24
Peanuts		200	3.5	24
Pecans		200	3.5	24
Pistachios		200	3.5	24
Walnuts		200	3.5	24
Apples	oriental fruit moth, coddling moth, apple maggot, apple curculio, twig borer, melon fruit fly, Mediterranean fruit fly, Oriental fruit fly, cherry fruit fly, brown mite, green peach aphid, scales, thrips	5	5	2
Apricots		20	5	2
Blueberries		20	1-2	3-4
Cherries		20	5	2
Nectarines		20	5	2
Peaches		20	5	2
Pears		5	5	2
Plums		20	5	2
Quinces		5	5	2
Strawberries		60(e)	2-3	3-4
Prunes	coffee bean weevil, Australian spider beetle, saw toothed and merchant grain beetles, dried fruit beetles, Indian meal moth, confused flour beetle, drugstore beetle, warehouse moth, common grain mite	20	5	2
Barley	granary weevil, lesser grain borer, rusty grain beetle, angoumois grain moth, Indian meal moth, confused flour beetle, rice weevil, saw toothed grain beetle, lesser grain borer, cadelle, khapra beetle, drugstore beetle, Australian spider beetle, cigarette beetle, warehouse moth, common grain mite, flat grain beetle, Mediterranean flour moth, red flour beetle, common bean weevil, copra beetle	50	5	12
Corn		50	2	24
Oats		50	3	24
Popcorn		240	1.5	2(a)
Rice		50	6	12(b)
Rice		50	3	24
Rye		50	3	24
Rye		50	6	12(b)
Sorghum (grain)		50	4	24
Wheat		50	3	24

COMMODITY	INSECTS CONTROLLED	TOLERANCE (ppm)	DOSAGE (lb/1000 ft^3)	EXPOSURE TIME (HRS)
Beans (all)	armyworms, cabbage looper, European corn borer, Japanese beetle, pod borers, Oriental fruit fly, Mediterranean fruit fly, corn earworm, green stink bug, sawbugs, spider mites, cabbage maggots, lygus bug, melon aphid, pickleworm, carrot rust fly, stink bug, bean leaf beetle, Mexican bean beetle, diabrotica beetle, cucumber beetle, squash bug, false chinch bug, loopers, symphylans blister beetles, onion maggot, onion thrips, mealybugs, pepper maggot, Colorado potato beetle, potato psyllid, squash bug, squash vine borer, earwigs, darkling beetle	50	3.5	2 4
Beets (roots)		30	3	4
Cabbage		50	4	4(d)
Cantaloupe		20	2	2
Carrots		30	4	4
Citron		30	3	2
Cucumbers		30	2.5	4
Eggplant		20	3	4
Honeydew Melons		20	2.5	2
Jerusalem Artichokes		30	3.5	4
Muskmelons		20	2.5	2
Okra		30	3.5	2 (c)
Onions		20	3	6
Parsnips (roots)		30	3	4
Peas (with pods)		50	3	2
Sweet Corn		50	3	4
Peppers		30	4	2
Pimentos		30	2.5	3
Pineapples		20	2	4
Potatoes		75	3	6
Pumpkins		20	2.5	2
Radishes		30	3	4
Rutabagas		30	3	6
Squash (summer)		30	4	2
Squash (winter)		20	4	2
Squash (zucchini)		20	Text	3
Sugar Beets (roots)		30	3	4
Sweet Potatoes		75	Text	4
Tomatoes		20	3	4
Turnips (roots)		30	3	4
Watermelons		20	2.5	2
Yams		30		4
Cipolini Bulbs	Exosoma lusitanica	50	4	4
Cocoa Beans	cocoa moth, cigarette beetle, confused flour beetle, warehouse moth, flat grain beetle, coffee bean weevil	50 50	1.5 1-2	12(a) 16-24
Cotton Seed	*Pectinophora spp.,* khapra beetle, boll weevil, saw toothed grain beetle	200	8	24(b)(c)
Garlic	Brachycera *spp.,* dyspessa *ulula,* brown wheat mite, onion maggot, onion thrips	50	3	4
Horseradish (roots)	*baris lepidii*	30	3	4
Salsify Roots	armyworm, flea beetle, leafhoppers, stink bugs, tarnished plant bug	30	3	3
Hay (alfalfa)	alfalfa weevil, cereal leaf beetle	50	3	24

COMMODITY	INSECTS CONTROLLED	TOLERANCE (ppm)	DOSAGE (lb/1000 ft^3)	EXPOSURE TIME (HRS)
Grapefruit [1]	*Anastrepha spp., Proeulia spp., Leptoglossus spp., Megalometis spp. Naupactus spp., Listroderes spp., Conoderus spp., Brevipalpus spp., ants* aphids, citrus scale, citrus mites, leaf rollers, white flies, thrips, California orangedog, mealybugs, orange tortrix	30	3	2
Grapes		20	4	2
Kumquat		30	3	2
Lemons[1]		30	3	2
Lime[1]		30	3	2
Orange(1)		30	3	2
Tangelos(1)		30	3	2
Tangerine(1)		30	3	2
Baled Tobacco	drugstore beetle, cigarette beetle, tobacco beetle, tobacco moth		2-3 4(a)	40-72 4
Processed Tobacco (i.e. cigars)			4(a)	4
Baled Cotton	pink bollworm, boll weevil		3 4 (a)	24 2

[1] Tolerance of fruit to methyl bromide may vary with different varieties. Check with local authorities or Great Lakes Chemical Corporation for additional information.

(a) Vacuum chamber fumigation.

(b) Khapra beetle quarantine.

(c) Pink bollworm quarantine.

(d) Must be used in accordance with the plant quarantine program of the USDA.

(e) Pre- and post-harvest.

TABLE II
APPLICATION SUMMARY FOR PROCESSED FOOD
METH-O-GAS 100

COMMODITY	INSECTS CONTROLLED	TOLERANCE (ppm)	DOSAGE (l b/1000 ft^3)	EXPOSURE TIME (hrs)
Apples (dried)	saw toothed beetle, merchant beetle, dried fruit beetle, Indian meal moth, confused flour beetle, Australian spider beetle, cigarette beetle, warehouse moth, common grain mite, coffee bean weevil, carob moth	125	1	24
Apricots (dried)		125	1	24
Cherries (dried)		125	1	24
Dates		125	1	24
Figs (dried)		250	1	24
Peaches (dried)		125	1	24
Prunes (dried)		125	1	24
Raisins (dried)		125	1	24
Cheese (Parmesan and roquefort)	cheese mites, cheese skipper, cheese maggot	325	1-2	12-24
Dried Peas	granary weevil, lesser grain borer, rusty grain beetle, angoumois grain moth, Indian meal moth, confused flour beetle, rice weevil, saw toothed grain beetle, lesser grain borer, cadelle, khapra beetle, drugstore beetle, Australian spider beetle, cigarette beetle, warehouse moth, common grain mite, flat grain beetle, Mediterranean flour moth, red flour beetle, common bean weevil, copra beetle	125	4	24
Eggs (dried)	larder beetle	400	I-2	12-24
Ham Houses	cheese skipper, larder beetle, red legged ham beetle, mites	325	I-2	12-24
Processed Foods	saw toothed beetle, flat grain beetle, flour beetle, cigarette beetle, Indian meal moth	125	I-2	12-24
Processed Grain (a)	confused flour beetle, rice weevil, granary weevil, saw toothed grain beetle, rusty grain beetle, lesser grain borer, cadelle, khapra beetle, drugstore beetle, Australian spider beetle, cigarette beetle	125	1.5	24

COMMODITY	INSECTS CONTROLLED	TOLERANCE (ppm)	DOSAGE (lb/1000 ft^3)	EXPOSURE TIME (hrs)
Processed Grain (b)	flour beetle, saw toothed grain beetle, Mediterranean flour moth	125	1-2	12-24
Processed Grain (c)	flour beetle, grain beetle, mealworms, cigarette beetle, Indian meal moth	125	1.5	24
Spices and Herbs (dried)	saw toothed beetle, flat grain beetle, cigarette beetle, trogoderma spp., Indian meal moth, dried fruit beetle, Australian spider beetle, warehouse moth, confused flour beetle, rusty grain beetle, lesser grain borer, drugstore beetle	400	3	12
Animal Feed (i.e. pet food)	cigarette beetle, saw toothed grain beetle, flour beetle, Indian meal moth	400	I-2	12-24

(a) Corn grits and cracked rice.

(b) Processed grain from equipment fumigation.

(c) Processed grain used in production of fermented beverages.

TABLE III
METH-O-GAS 100
APPLICATION SUMMARY FOR STRUCTURES CONTAINING RAW OR PROCESSED COMMODITIES'

TREATMENT SITE	PESTS	VOLUME	RATE (lb/1000 ft3)	EXPOSURE TIME (hrs)
Warehouse Grain Elevator Food Processing Plant Restaurant Feed Room Grain Bin	cockroaches, confused flour beetle, rice weevil, granary weevil, saw toothed grain beetle, rusty grain beetle, lesser grain borer, cadelle, khapra beetle, drugstore beetle, larder beetle, carpet beetle, copra beetle, coffee bean weevil, groundnut bruchid, common bean weevil, dried fruit beetle, golden spider beetle, Australian spider beetle, cigarette beetle, angoumois grain moth, Mediterranean flour moth, warehouse moth, Indian meal moth, common grain mite	less than 100,000 ft^3 100,000-500,000 ft^3 500,000-1,000,000 ft^3 over 1,000,000 ft^3	1-3 1-1.5 1-1.25 1	24 24 24 24
	rats and mice		4-5 oz.	12-18

At temperatures below 60°F., increase the dosage by 1/2 lb per 1,000 cu. ft. for every 10°F drop in temperature or use an approved procedure to heat the fumigant. Do not fumigate when temperature is below 40°F.

NOTE: Remove food and feed commodities not listed in Tables I and II before fumigating structures.

TABLE IV
APPLICATION SUMMARY FOR NON-FOOD PRODUCTS
METH-O-GAS® 100

MATERIALS AND PRODUCTS	PESTS CONTROLLED	DOSAGE (lb/1000 ft^3)	EXPOSURE TIME (hrs)
Machinery, packing & bagging material, miscellaneous non-food cargo, (e.g., ceramic, marble, brassware, handicrafts, burlap, appliances)	woodboring insects, Coleoptera, mites, spiders, snails, cockroaches, Lepidoptera	2-6	24-72
Forest and plant products (e.g., lumber, firewood, driftwood, pallets, crates, paper, cardboard, carvings, grapevine wreaths, dried plants, Spanish moss, bamboo and wicker, mulch, etc.)	woodborers, bark beetles, termites, carpenter ants, horntails, old house borer, powder post beetles, Hymenoptera, Coleoptera, woodworm, wharf borer, wood wasps, mites, Lepidoptera	3-6	16-24