

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

22 SEP 1988

**BEST AVAILABLE COPY**

Dennis K. Prober  
Van Waters & Rogers, Inc.  
Subsidiary of UNIVAC  
2256 Junction Avenue  
San Jose, CA 95131

Subject: Methyl Bromide Registration Standard  
NAMCO Pathofume  
EPA Registration No. 550-117  
Your Application of June 27, 1988

Dear Mr. Prober:

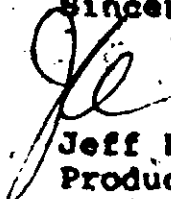
Your submission has been reviewed and found to be acceptable for the product listed above.

Enclosed for this product is stamped, approved labeling. Incorporate the following comment and submit five copies of finished printed labeling for our records.

Under "Disposal" revise "Pesticide wastes are acutely hazardous." to "Pesticide wastes are toxic."

You are reminded that an application manual must be provided to applicators who use this product. You should contact one of your suppliers and have them provide you with their approved application manual for distribution.

Sincerely,



Jeff Kempter  
Product Manager (32)  
Antimicrobial Program Branch  
Registration Division (TS-767C)

Enclosure

TS-767C:APB:WFrancis:wcf:Rm.711;557-6909:9-21-88

CONCURRENCES

SYMBOL	SURNAME	DATE					

CYLINDER LABEL w/ PRODUCT BULLETIN

**RESTRICTED USE PESTICIDE DUE TO ACUTE TOXICITY**

For retail sale to and use only by **CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION**, and only for those uses covered by the **CERTIFIED APPLICATOR'S CERTIFICATION**.



PRECAUTIONAL USUARIO: Si usted no lee Ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

**NAMCO®**

**Pathofume B**

For use as a pre-plant soil fumigant. Use in structures is limited to soil treatment in greenhouses.

ACTIVE INGREDIENTS: Methyl Bromide . . . . .67%  
Chloropicrin . . . . .33%  
This Product Weighs 14.2 pounds per gallon

**KEEP OUT OF REACH OF CHILDREN, IRRESPONSIBLE PERSONS AND PETS**

**DANGER** **POISON** **PELIGRO**

In all cases of over-exposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.

**STATEMENT OF PRACTICAL TREATMENT**

**IF INHALED:** Remove exposed person from contaminated area. Keep warm. Make sure person can breathe freely. If breathing has stopped, give artificial respiration. Do not give anything by mouth to an unconscious person. If not unconscious, rinse mouth out with water.

**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 over exposures 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, if at all, the degree of exposure. Treatment is symptomatic. See the product MSDS for additional information.

Formulated by

**Van Waters & Rogers Inc.**  
subsidiary of UNIVAR  
Seattle, WA 84104



EPA Reg. No. 550-117-AA  
EPA Est. No. 550-CA-1

GROSS WT	TARE WT	NET WT

**PRECAUTIONARY STATEMENT**

**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**  
**DANGER**

Extremely hazardous liquid and vapor under pressure. Do not breathe vapor. It may cause serious acute illness or delayed lung, nerve or brain injury. Liquid or vapor may cause skin or eye injury which may have a delayed onset. Do not get liquid on skin, eyes or clothing.

This product contains chloropicrin which may be irritating to the upper respiratory tract, causing painful irritation to the eyes, producing watering. If these symptoms occur, leave the area immediately.

**RESPIRATORY PROTECTION:** Under normal conditions of use, no respiratory protection is required. However, the following information regarding respiratory protection should be read. Concentration of methyl bromide and chloropicrin in the worker area, as measured by appropriate detector tubes (for example, Draeger, Kitagawa, MSA, and Sensidyne) should not exceed 20 mg/M3 for methyl bromide or 0.1 ppm (0.7 gm/M3) for chloropicrin. If these concentrations are exceeded at any time, or the concentration of either chemical in the fumigation area must wear a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air supplied respirator or evacuate the area. Protection to be worn any time respiratory protection is required. Because there is always a possibility of leak, the SPILL AND LEAK PROCEDURES under STORAGE, HANDLING, AND DISPOSAL should be read and followed.

**PROTECTIVE CLOTHING:** Methyl bromide may be trapped inside clothing and shoes, long sleeved shirts, long trousers and socks that are cleaned after each use. Do not wear jewelry, gloves or other gas confining apparel. If full face respirator is not required, wear a full face shield for eye protection when handling liquid fumigant. Immediately remove clothing, shoes and socks. Do not reuse contaminated clothing. Decontaminate by airing and washing. Open-toed shoes cannot be adequately decontaminated and should be disposed of properly.

**POSTING OR PLACARDING REQUIREMENT:** The applicator must placard or post the fumigated area with signs bearing, in English and Spanish:

- 1 The signal word DANGER/PELIGRO and the skull and cross-bones symbol.
- 2 The statement, "Area under fumigation, DO NOT ENTER/NO ENTREE"
- 3 The date of fumigation
- 4 Name of fumigant used, i.e., methyl bromide with chloropicrin
- 5 Name, address, and telephone number of the applicator
- 6 Additional information required by local or state regulations.

Only a certified applicator or someone under his/her supervision may remove placards. The concentration of methyl bromide in the treated site is below 5 ppm and chloropicrin is below 0.1 ppm.

**ENVIRONMENTAL HAZARDS:** This pesticide is toxic to wildlife. Do not discharge this product into lakes, streams, ponds, estuaries, oceans, or public waters unless specifically identified and addressed in an NPDES permit. Do not discharge effluent to sewer systems without notifying the sewerage treatment plant authority. For more information, contact the State Water Board or Regional Office of the EPA.

**PHYSICAL HAZARDS:** Contents under pressure. Do not use or store near heat or open flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause leakage.

**CHEMICAL HAZARDS:** This product is nonflammable. There is no danger from contact with water. However, flames and other heat sources above 300°F can cause the product to liberate toxic and corrosive gases. The use of the product with aluminum and alkali metals will result in the liberation of toxic gases, and possible fire and explosion, severe corrosion of containers and equipment made of these metals may occur.

**DIRECTIONS FOR USE**

*It is a violation of Federal Law to use this product in a manner inconsistent with the label.*

This fumigant is a highly hazardous material and should be used only by individuals who are trained and experienced in the proper use. Before using, read and follow all label precautions and instructions.

All persons working with this fumigant must be knowledgeable about the hazards and use of required respirator equipment and detector devices, emergency procedures, and the fumigant.

This product is to be used only for pre-plant soil fumigation. Extreme caution should be taken when fumigating next to fields with animals or next to buildings inhabited by humans or animals.

**Conditions of Sale and Warranty**

The Directions for Use of this product reflect the opinion of experts based on field use and laboratory tests and it could be followed carefully. However, it is impossible to eliminate all risks with the use of this product. Crop injury, ineffectiveness, or other unintended consequences may result from the use of this product, the presence of other materials, or the manner of use or application all of which are beyond the control of Van Waters & Rogers Inc. All such risks shall be assumed by the Buyer.

**Seller makes no warranty, express or implied, concerning this material or its use, other than that indicated on the label. Buyer assumes all risk of use and/or handling of this material if such use or handling is contrary to label instructions.**

**Residues and Tolerances**

As a pesticide chemical, it is poisonous and may leave a toxic residue on the plants to which it is applied. The Environmental Protection Agency has established maximum amounts of such pesticide chemicals that may remain on or in food crops at harvest, and it is the user's responsibility to see that there is no residue on or in the crop in excess of these amounts. The "Directions for Use" are based on the best available information, and it is the user's responsibility to ensure that the residue levels are within the tolerance limits.

# COMPLETE CYLINDER LABEL

## RESTRICTED USE PESTICIDE DUE TO ACUTE TOXICITY

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**NAMCO**®

## Pathofume B

For use as a pre-plant soil fumigant. Use in structures is limited to soil treatment in greenhouses.

ACTIVE INGREDIENTS: Methyl Bromide . . . . .67%  
Chloropicrin . . . . .32%  
This Product Weighs 14.2 pounds per gallon

### KEEP OUT OF REACH OF CHILDREN, IRRESPONSIBLE PERSONS AND PETS

**DANGER** **POISON** **PELIGRO**

In all cases of over-exposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.

#### STATEMENT OF PRACTICAL TREATMENT

**IF INHALED:** Remove exposed person from contaminated area. Keep warm. Make sure person can breathe freely. If breathing has stopped, give artificial respiration. Do not give anything by mouth to an unconscious person. If not unconscious, rinse mouth out with water.

**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 over exposures 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. See the product MSDS for additional information.

Formulated by

**Van Waters & Rogers Inc.**

subsidiary of UNIVAR

Seattle, WA 98110



EPA Reg. No. 550-117-AA

EPA Est. No. 550-CA-1

GROSS WT	TARE WT	NET WT

## PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

### DANGER

Extremely hazardous liquid and vapor under pressure. Do not breathe vapor. Inhalation may be fatal or cause serious acute illness or delayed lung, nerve or brain injury. 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.

This product contains chloropicrin which may be irritating to the upper respiratory tract, and cause painful irritation to the eyes, producing watering. If these symptoms occur, leave the fumigation area immediately.

**RESPIRATORY PROTECTION:** Under normal conditions of use, no respiratory protection will be required. However, the following information regarding respiratory protection should be known. If the concentration of methyl bromide and chloropicrin in the worker area, as measured by a pump and the appropriate detector tubes (for example, Dräger Kitagawa, MSA, and Sensidyne), does not exceed 5 ppm (20 mg/M3) for methyl bromide and 1 ppm (3.3 mg/M3) chloropicrin, no respiratory protection is required. If these concentrations are exceeded at any time, or the concentration is unknown, all persons in the fumigation area must wear a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator or evacuate the area. Protective clothing is required to be worn any time respiratory protection is required. Because there is always a possibility of a spill or leak, the SPILL AND LEAK PROCEDURES under STORAGE, HANDLING AND DISPOSAL must be understood and followed.

**PROTECTIVE CLOTHING:** Methyl bromide and chloropicrin may be trapped inside clothing and cause skin injury. Wear loose, long sleeved shirts, long trousers and socks that are cleaned after each wearing, or disposable clothing. Do not wear jewelry, gloves or other gas confining apparel. If full face respiratory protection is not required, wear a full face shield for eye protection when handling liquid fumigant. After exposure, immediately remove clothing, shoes and socks. Do not reuse contaminated clothing until thoroughly decontaminated by airing and washing. Drenched shoes cannot be adequately decontaminated and should be disposed of properly.

**POSTING OR PLACARDING REQUIREMENT:** The applicator must placard or post all entrances to the fumigated area with signs bearing, in English and Spanish:

- 1 The signal word DANGER/PELIGRO and the skull and cross-bones symbol.
- 2 The statement, "Area under fumigation, DO NOT ENTER/NO ENTREE"
- 3 The date of fumigation.
- 4 Name of fumigant used, i.e., methyl bromide with chloropicrin.

5 Name, address, and telephone number of the applicator.  
6 Additional information required by local or state regulations.  
Only a certified applicator or someone under his/her supervision may remove placards and only when the concentration of methyl bromide in the treated site is below 5 ppm and chloropicrin is below 0.1 ppm.

**ENVIRONMENTAL HAZARDS:** This pesticide is toxic to wildlife. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

**PHYSICAL HAZARDS:** Contents under pressure. Do not use or store near heat or open flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause bursting.

**CHEMICAL HAZARDS:** This product is nonflammable. There is no danger from fire or explosion in use concentrations. However, flames and other heat sources above 300°F can cause degradation of this product to liberate toxic and corrosive gases. The use of this product with aluminum, magnesium, zinc, and alkali metals will result in the liberation of toxic gases, and possible fire and explosion. In addition, severe corrosion of containers and equipment made of these metals may occur.

### 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 should be used only by individuals trained in its proper use. Before using, read and follow all label precautions and directions.

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

This product is to be used only for pre-plant soil fumigation.

Extreme caution should be taken when fumigating next to fields with animals or valuable crops, or next to buildings inhabited by humans or animals.

#### Conditions of Sale and Warranty

The Directions for Use of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness, or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application all of which are beyond the control of Van Waters & Rogers Inc. All such risks shall be assumed by the Buyer.

**SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THIS MATERIAL OR THE USE OF THIS PRODUCT OTHER THAN INDICATED ON THE LABEL. BUYER ASSUMES ALL RISK OF USE AND/OR HANDLING OF THIS MATERIAL WHEN SUCH USE OR HANDLING IS CONTRARY TO LABEL INSTRUCTIONS.**

#### Residues and Tolerances

Any preplant chemicals are poisonous and may have a toxic residue on the plants to which they are applied. The U.S. Environmental Protection Agency has established maximum amounts of such preplant chemicals that may remain on raw agricultural products at harvest, and it is the user's responsibility to see that there is no residue on such crops at harvest 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 at harvest. However, Van Waters & Rogers Inc. assumes no responsibility as to their accuracy and for any loss due to excessive residues.

# INHALATION HAZARD



## POISON

6

### METHYL BROMIDE AND MORE THAN 2% CHLOROPICRIN MIXTURE, LIQUID NA1581

NAMCO Patholume B Rate/Exposure Table

TREATMENT SITE	RATE <sup>1</sup> & METHOD <sup>2</sup>	EXPOSURE TIME
Field soils to be planted to: Asparagus, broccoli, cauliflower, eggplant, lettuce <sup>3</sup> , mullberries, onions (dry bulb) <sup>4</sup> , peppers, pineapples, strawberries, tomatoes	270-360 lb/A	24-48 hr.
Florida Citrus <sup>5</sup>	1.5-2 lb/100 sq. ft.	24-48 hr.
Nursery and greenhouse soils, seed and transplant beds and turf:		
Non food crops	270-650 lb/A	24-48 hr.
Tobacco	1.5 lb/100 sq. ft.	24-48 hr.
Tomato (greenhouse crop)	270-360 lb/A	24-48 hr.

- Use the higher rates in finer soils and those high in organic matter.
- Methods of application is by injection with chisels plus covered with tarpaulin.
- Use limited to one application in 2 to 3 years. Use limited to California only. Lettuce big vein is also controlled.
- Onions (dried seeded/dry bulb). West of Rockies only. White rot is also controlled.
- May not bear harvestable fruit within 24 months.
- Seeds of certain weeds such as clover, morningglory, flume, and others with hard seeds may require a higher dosage or a longer exposure period for effective control.

The Halide Leak Detector This detector is useful in detecting gross leaks of this product such as around taping and tarps. Since the detector cannot normally detect methyl bromide concentrations below 50 ppm, while the TLV is 5 ppm, the detector should not be used to determine appropriate respiratory protection or the adequacy of aeration. The following tabulation gives the approximate methyl bromide concentration associated with color intensity in the flame. During use at night the flame has a bluish cast which has to be taken into consideration; otherwise the color changes are the same.

This Product ppm Present	Pounds per 1000 cubic feet	Flame Color in Daylight
0	0	No color
25	0.00625	Faint fringe of green
50	0.0125	Moderate green
125	0.031	Green
250	0.0625	Strong green
500	0.125	Strong green-blue fringe
600	0.20	Strong blue-green
1000	0.25	Blue

### After Applying Fumigant

- Post all treated areas with warning signs as proscribed in POSTING OR PLACARDING REQUIREMENTS under PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS.
- Keep all animals, children and unauthorized people away from area during removal of tarpaulin.
- Two trained persons must be present during removal of the tarpaulin.
- Tarpaulin should be removed when there is adequate air movement to dilute remaining fumigant in the working area below 5 ppm for methyl bromide and 0.1 ppm for chloropicrin. Because air movement is generally greater during the daytime this is the preferred time for removal of the tarpaulin.

### Additional Precautions

This product is toxic to plants, so do not apply to areas containing roots of desirable vegetation. The edge of the cover should be at least two feet away from the roots of living plants. Care should be taken to prevent chloropicrin vapors from reaching desirable adjacent vegetation. Do not allow domestic animals to feed on crop residues unless a tolerance exists for such use. Adverse Effects On Nitrification Fumigation may temporarily reduce nitrification in the soil thus increasing levels of ammonia nitrogen and soluble ammonium salts to potentially phytotoxic levels. Accumulation of ammonia may be likely to occur when maximum rates of fumigant and fertilizer are applied to soils that are acidic, wet, cold, or high in organic matter. Apply only fertilizer containing at least 30% nitrate nitrogen until the crop is well established and soil temperature is above 65°F, then fertilize as indicated by soil test. Acid soils should be limed before fumigation to stimulate nitrification and to reduce possible ammonium toxicity. Preventing Recontamination of Treated Areas Do not contaminate fumigated areas by walking from unfumigated soil. Clean your shoes thoroughly if this is necessary. If the treated bed is in a location where flooding or washing is possible after rain, plow a furrow or make a trench around treated area for proper drainage. Wooden frames around the trench are also satisfactory for preventing the type of contamination. Cleaning of Application Equipment Application equipment should be cleaned immediately after use by flushing with diesel oil or kerosene. Note: water will increase the corrosive action of soil fumigants and should not be used.

**A. Tarpaulin Methods for Field, Nursery, Turf, & Seed or Transplant Bed Soils:**

- Overall Application:** Inject the product with a chisel type applicator having the chisel spaced no more than 12 inches apart and injecting the fumigant to a depth of 6 to 10 inches below the soil surface. The soil surface must be covered immediately after treatment with simultaneous film laying equipment or by sealing roller or subpacker and covered within 20 minutes with polyethylene film or other suitable cover. Consult appropriate Rate/Exposure Table for proper rate of application and exposure periods.
- Row or bed applications:** Apply the broadcast rate to the area actually treated, i.e., the area delimited by the film mulch. Consult the appropriate Rate/Exposure Table for treatment rates and exposure periods. Use one or more shanks per bed spaced not more than 12 inches apart, depending upon the area to be treated. Inject the product with a chisel type applicator having the chisel spaced no more than 12 inches apart and injecting the fumigant to a depth of 6 to 10 inches below the soil surface. The soil surface must be covered immediately after treatment with simultaneous film laying equipment or by sealing with a roller or subpacker and covered within 20 minutes with polyethylene film or other suitable cover.

At the end of the exposure period, remove tarpaulin and aerate for at least two weeks before setting out transplants or vegetable plant parts. Crop seeds may be planted after 96 hours following the exposure period. If odor of fumigants persists at the end of the aeration period, disk or plow the soil to assist aeration. Where polyethylene film is to be utilized as a mulch, aeration is accomplished by making holes in the film on spacings appropriate for the crop to be planted.

**B. Special Instructions for Greenhouse Soil Fumigation.**

The use of methyl bromide and chloropicrin in confined spaces presents a potential hazard to humans and plants. Special precautions must be taken in order that these potential hazards be minimized. It is the responsibility of the individual user using the fumigation operation to see that all safety precautions are strictly observed. Before the fumigation operation commences, the supervisor of the fumigation job shall have conducted proper training of all personnel involved in the fumigation (includes use of safety equipment), removed all persons from the area not directly involved in the fumigation, and inspected the equipment to ensure proper application. Two persons trained in the use of this product must be present during introduction of the fumigant, testing of the tarpaulin during aeration, and after aeration when testing for reentry. Two persons do not need to be present if monitoring is conducted remotely (outside the area being fumigated). If the concentration of methyl bromide is determined using an appropriate pump and detector tubes does not exceed 5 ppm for methyl bromide and 0.1 ppm for chloropicrin in the worker area detector tubes, no respiratory protection is required. Fumigation of greenhouse soils may be done by either Overall or Row or Bed Application described above depending on the greenhouse size and accessibility to equipment. Consult Rate/Exposure Table below for proper rates of application and exposure periods. If a wind is blowing, all injections should be made upwind from a previous injection site. Immediately after injection of the fumigant and tarpaulin, a qualified person, wearing protective equipment, should monitor the tarpaulin area with a halide detector. If excessive leaks are found, the source of the leak should be sealed immediately. During the fumigation application and the checking of the tarps with the halide leak detector, all working windows and doors should be open and fans operating to maximize ventilation. After fumigation, the greenhouse must be placarded on all entrances to the fumigated area with signs conforming to Posting and Placarding Requirements in the PRECAUTIONARY STATEMENTS: HAZARDS TO HUMANS AND DOMESTIC ANIMALS and all entrances secured to prevent entry of unprotected persons and animals.

**Aeration and Reentry:** After fumigation, treated areas must be aerated until the concentrations are determined to be less than 5 ppm for methyl bromide and 0.1 ppm for chloropicrin. Do not allow entry into the treated area by any person before the 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. In greenhouses keep all operational windows and doors open and fans turned on until the greenhouse is completely aerated. Do not remove the placards until the treated area is aerated to below the levels indicated above. When aeration is complete, the placards may be removed by a certified applicator or someone under his/her supervision.

**C. Special Instructions for Florida Citrus**

Preplant or replant fumigation of citrus soil for control of Phytophthora and citrus nematodes in Florida sandy soils. Trees which are planted in this treated soil will not bear harvestable fruit for a period of at least 24 months. Apply with chisels spaced 12 inches apart to a depth of 6 to 8 inches and seal immediately with 4 mil polyethylene. Apply this product at the rate shown on the appropriate table for the product of choice. Expose to fumigation for 96 hours. This treatment will control disease to a depth of 4 feet. Remove cover and aerate for two weeks before setting transplants in treated soils.

## STORAGE, HANDLING, AND DISPOSAL

**CYLINDER STORAGE AND HANDLING:** Store in a locked, dry, cool, 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, lumps 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 protective bonnet before returning to shipper. Only the registrant, or his designee is authorized to refill cylinders. Do not use cylinders for any other purpose.

**DISPOSAL - Pesticides:** Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide 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. Cylinders: Cylinders remain the property of Van Waters & Rogers Inc. Any empty, defective, and unneeded cylinders should be returned to Van Waters & Rogers Inc.; call the local office or (408) 435-8700 to arrange for pick-up. Credit will be issued for partial cylinders. Do not ship cylinders without safety caps and protective bonnets.

**SPILL AND LEAK PROCEDURES:** Evacuate immediate area of spill or leak. Do not permit re-entry into spill area by unprotected persons until the concentrations are determined to be less than 5 ppm for methyl bromide and 0.1 for chloropicrin. Note: Applying water to spills of this product complicates detection of spilled material, increases the product's evaporation time and spreads contamination. If leak occurs while cylinder is on tractor, i.e., rupture of hose or fitting, immediately stop tractor and motor. Use NIOSH/MSHA approved self-contained SCBA or combination air-supplied/SCBA respirator for entry into affected area to correct problem. Move leaking or damaged cylinders outdoors or to an isolated location, observing strict safety precautions. Work upwind if possible. Allow spill to evaporate. Because of the high percentage of chloropicrin (boiling point 220°F) in this product this may take some time. Increasing the air flow and/or temperature in the area of the spill will speed up the evaporation process. Alternatively, a leaking cylinder may be removed to an isolated area and the contents discharged under a polyethylene sheeting of 4 mil or greater thickness into the soil surface in accordance with instructions under Soil Fumigation Directions. Contaminated soil, water, and other clean up 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.

### Pests Controlled

This product is useful in controlling the following pests when present at the time of treatment. Plant-parasitic nematodes, including root-knot, root lesion (meadow), cyst, citrus, burrowing, late root knot, lance, spiral, ring, sting, stubby root, dagger, and sheath and stunt (sawfly). Soil borne disease organisms, including Pythium, Rhizoctonia, Phytophthora, Pyrenochaeta, Sclerotinia, Sclerotium, Fusarium and the clubroot organism, Plasmodiophora. Weeds and weed seed, broadleaf weeds and grasses including quackgrass, annual bluegrass, broom rape, common lambsquarters, topsoilgrass and Bermuda grass. While normally not effective against seeds of dodder, flume, mallow, morning glory and some species of clover, enhanced control may be obtained by using higher dosages and/or longer exposure periods. Insects in the soil, including wire-worms, cutworms, grubs, rootworms, and garden symphylans.

### Treatment Conditions

When to Treat: Treatments can be made any time of year when soil conditions are suitable. In northern states, late summer or early fall treatments are best for land to be planted to early spring crops. Temperature Requirements: Do not fumigate if the soil temperature is below 50°F. For the best results, fumigate when soil temperature is 60 to 80°F at the depth of 6 to 8 inches. Pre-treatment Soil Preparation: Plow or rip or otherwise till the soil to the depth to which effective treatment is required. The soil should be worked until free of clods or large lumps. Residue from previous crops should be worked into the soil to allow for decomposition prior to fumigation. Soil moisture should be optimum for seed germination. Coarse textured soils can be fumigated with higher moisture content than fine textured soils. For best results soil should be kept moist for at least four days prior to treatment.

### APPLICATION PRECAUTIONARY STATEMENTS

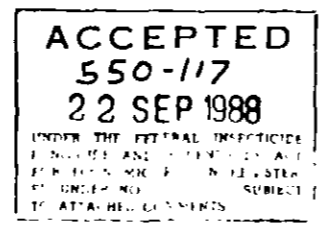
The following precautions must be followed:

#### Prior to Fumigation

- Comply with all local regulations and ordinances. Obtain an application permit from agricultural regulatory agencies as required.
- Two trained persons must be present during the introduction of the fumigant. Never fumigate alone. It is imperative always to have an assistant and proper protective equipment in case of accidents.
- Persons in charge of all operations must advise other workers of all safety precautions and procedures. In addition, they must instruct their helpers in the mechanical operation of the equipment.
- Handle the fumigant in the open, with the operator "up wind" from the container where there is good ventilation.
- Check fumigant pressure system for leaks and calibrate equipment before beginning operation.
- When fumigating soil from a tractor, 5 gallons of water must be carried on the tractor and placed where it is readily accessible. In addition to water available on the tractor, at least 5 gallons additional water must be available from the service truck. This water must be potable and in containers marked "Decontamination water not to be used for drinking."
- All trash should be cleared from the field before starting fumigation.

#### During Fumigation

- Two trained persons must be present during introduction of the fumigant.
- This product should not be applied when there is little or no air movement nor when there is an atmospheric inversion. If an atmospheric inversion occurs following application, the tarpaulin should not be removed for a minimum of 48 hours to prevent uncomfortable concentrations of chloropicrin from drifting into nearby inhabited areas.
- Do not fit injection shanks to turn at the end of a pass until fumigant has drained from system following closure of shank valve.
- If trash is inadvertently pulled up by the shanks to the end of the field when fumigating, it must be covered by flange the shanks, then covering the trash with polyethylene film before making the turn for the next pass.
- When changing the cylinders, be certain they are turned off and fumigant system is not under pressure.



### SALES

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**RESTRICTED USE PESTICIDE DUE TO ACUTE TOXICITY**

For retail sale to and use only by CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION, and only for those uses covered by the CERTIFIED APPLICATOR'S CERTIFICATION.

PRECAUTIONAL USUARIO: Si usted no lee inglés, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.



**NAMCO**®

Pathofume 75/25  
Pathofume B

Pathofume 57/43  
Trifume 2+2

Trifume

For use as a pre-plant soil fumigant. Use in structures is limited to soil treatment in greenhouses.

**Table of Contents**

Key: A = Front Panel; B = Back Panel; Numbers 1 - 4 refer to the approximate quarter of the panel

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Product	Active Ingredients (%)		Lbs./Gal	EPA Reg. No.
	Methyl Bromide	Chloropicrin		
Pathofume 75/25	75	25	14.2	550-137-AA
Pathofume 57/43	57	43	14.2	550-129-AA
Pathofume B	67	33	14.2	550-117-AA
Trifume 2+2	50	50	14.1	550-128-AA
Trifume	43	57	14.2	550-116-AA

**KEEP OUT OF REACH OF CHILDREN, IRRESPONSIBLE PERSONS AND PETS**

**DANGER POISON PELIGRO**

In all cases of over-exposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.

**STATEMENT OF PRACTICAL TREATMENT**

**IF INHALED:** Remove exposed person from contaminated area. Keep warm. Make sure person can breathe freely. If breathing has stopped, give artificial respiration. Do not give anything by mouth to an unconscious person. If not unconscious, rinse mouth out with water.

**IF ON SKIN:** Immediately remove contaminated clothing, shoes, and any other items from 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 over-exposures 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. See the product MSDS for additional information.

**ACCEPTED**  
350-117  
22 SEP 1988

UNDER THE FEDERAL INSECTICIDE ACT  
EPA REG. NO. 550-117-AA  
EPA EST. NO. 550-131-AA

Formulated by  
**Van Waters & Rogers Inc.**  
subsidiary of UNIVAR  
Seattle, WA 98104  
EPA EST. No. 550-131-AA

- Persons in charge of all operations must advise other workers of all safety precautions and procedures. In addition, they must instruct their helpers in the mechanical operation of the equipment.
- Handle the fumigant in the open, with the operator 'up wind' from the container where there is good ventilation.
- Check fumigant pressure system for leaks and calibrate equipment before beginning operation.
- When fumigating soil from a tractor, 5 gallons of water must be carried on the tractor and placed where it is readily accessible. In addition to water available on the tractor, at least 5 gallons additional water must be available from the service truck. The water must be potable and in container marked 'Decontamination water not to be used for drinking.'
- All trash should be cleared from the field before starting fumigation.

**During Fumigation**

- Two trained persons must be present during introduction of the fumigant.
- This product should not be applied when there is little or no air movement nor when there is an atmospheric inversion. If an atmospheric inversion occurs following application, the tarpaulins should not be removed for a minimum of 48 hours to prevent uncomfortable concentrations of chloropicrin from drifting into nearby inhabited areas.
- Do not let injection shanks to turn at the end of a pass until fumigant has drained from system following closure of shutoff valve.
- If trash is inadvertently pulled up by the shanks to the end of the field when fumigating, it must be covered by tying the shanks, then covering the trash with polyethylene film before making the turn for the next pass.
- When changing the cylinders, be certain they are turned off and fumigant system is not under pressure.

**After Applying Fumigant**

- Post all treated areas with warning signs as provided in POSTING OR PLACARDING REQUIREMENTS under PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS.
- Keep all animals, children and unauthorized people away from area during removal of tarpaulin.
- Two trained persons must be present during removal of the tarpaulin.
- Tarpaulins should be removed when there is adequate air movement to dilute remaining fumigant in the working area below 5 ppm for methyl bromide and 0.1 ppm for chloropicrin. Because air movement is generally greater during the daytime this is the preferred time for removal of the tarpaulins.

**Additional Precautions**

This product is toxic to plants. Do not apply to areas containing roots of desirable vegetation. The edge of the cover should be at least two feet away from the roots of living plants.

Care should be taken to prevent chloropicrin vapors from reaching desirable adjacent vegetation.

Do not allow domestic animals to feed on crop residues unless a tolerance exists for such use.

**Adverse Effects On Nitrification:** Fumigation may temporarily reduce nitrification in the soil thus increasing levels of ammonium nitrogen and soluble ammonium salts to potentially phytotoxic levels. Accumulation of ammonium is most likely to occur when maximum rates of fumigant and fertilizer are applied to soils that are acidic, wet, cold, or high in organic matter. Apply only fertilizer containing at least 30% nitrate nitrogen until the crop is well established and soil temperature is above 55°F, then fertilize as indicated by soil test. Acid soils should be limed before fumigation to stimulate nitrification and to reduce possible ammonium toxicity.

**Preventing Recontamination of Treated Areas:** Do not contaminate fumigated areas by walking from unfumigated soil. Clean your shoes thoroughly if this is necessary. If the treated bed is in a location where flooding or washing is possible after rains, plow a furrow or make a trench around treated area for proper drainage. Wooden frames around the beds are also satisfactory for preventing this type of contamination.

**Cleaning of Application Equipment:** Application equipment should be cleaned immediately after use by flushing with diesel oil or kerosene. Note: water will increase the corrosive action of soil fumigants and should not be used.

**A. Tarpaulin Methods for Field, Nursery, Turf, & Seed or Transplant Bed Soils:**

- Overall Application:** Inject the product with a chisel type applicator having the chisels spaced no more than 12 inches apart and injecting the fumigant to a depth of 6 to 10 inches below the soil surface. The soil surface must be covered immediately after treatment with simultaneous film laying equipment or by sealing roller or cultipacker and covered within 20 minutes with polyethylene film or other suitable cover. Consult appropriate Rate/Exposure Table for proper rate of application and exposure periods.
- Row or Bed Applications:** Apply the broadcast rate to the area actually treated, i.e. the area delimited by the film mulch. Consult the appropriate Rate/Exposure Table for treatment rates and exposure periods. Use one or more shanks per bed spaced not more than 12 inches apart, depending upon the area to be treated. Inject the product with a chisel type applicator having the chisels spaced no more than 12 inches apart and injecting the fumigant to a depth of 6 to 10 inches below the soil surface. The soil surface must be covered immediately after treatment with simultaneous film laying equipment or by sealing with a roller or cultipacker and covered within 20 minutes with polyethylene film or other suitable cover.

At the end of the exposure period, remove tarpaulins and aerate for at least two weeks before setting out transplants or vegetative plant parts. Crop seeds may be planted after 96 hours following the exposure period. If odor of fumigant persists at the end of the aeration period, dig or plow the soil to assist aeration. Where polyethylene film is to be utilized as a mulch, aeration is accomplished by making holes in the film on spacings appropriate for the crop to be planted.

**B. Special Instructions for Greenhouse Soil Fumigation.**

The use of methyl bromide and chloropicrin in confined spaces presents a potential hazard to human and plant life. Special precautions must be taken in order that these potential hazards be minimized. It is the responsibility of the individual supervising the fumigation operation to see that all safety precautions are strictly observed. Before the fumigation operation commences, the supervisor of the fumigation job shall have conducted proper training of all personnel involved in the fumigation (includes use of safety equipment), removed all persons from the area not directly involved in the fumigation, and inspected the equipment to ensure proper application.

Two persons trained in the use of the product must be present during introduction of the fumigant, testing of the tarpaulin during aeration, and after aeration when testing for reentry. Two persons do not need to be present if monitoring a container externally (outside the area being fumigated). If the concentration of methyl bromide is determined using an appropriate pump and detector tubes does not exceed 5 ppm for methyl bromide and 0.1 ppm for chloropicrin in the worker area detector tubes, no respiratory protection is required.

Fumigation of greenhouse soils may be done by either Overall or Row or Bed Application described above depending on the greenhouse size and accessibility to equipment. Consult Rate/Exposure Table below for proper rates of application and exposure periods. If a wind is blowing, all injections should be made upwind from a previous injection site. Immediately after injection of the fumigant and tarpaulin, a qualified person wearing protective equipment, should monitor the tarpaulin area with a halide detector. If excessive leaks are found, the source of the leak should be sealed immediately.

During the fumigant application and the checking of the tarps with the halide leak detector, all working windows and doors should be open and fans operating to maximize ventilation. After fumigation, the greenhouse must be placarded on all entrances to the fumigated area with signs conforming to Posting and Placarding Requirements in the PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS and all entrances secured to prevent entry of unprotected persons and animals.

**Aeration and Reentry:** After fumigation, treated areas must be aerated until the concentrations are determined to be less than 5 ppm for methyl bromide and 0.1 ppm for chloropicrin. Do not allow entry into the treated area by any person before the use of self-contained protective clothing and a respiratory protection device, NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air supplied SCBA respirator, a worn in greenhouses. Keep all operational windows and doors open and fans turned on until the greenhouse is completely aerated. Do not remove the placards until the treated area is aerated to below the levels indicated above. When aeration is complete, the placards may be removed by a certified applicator or someone under his/her supervision.

**C. Special Instructions for Florida Citrus**

Preplant or replant fumigation of citrus soil for control of Phytophthora and other nematodes in Florida sandy soils. Trees which are planted in the treated soil will not bear harvestable fruit for a period of at least 24 months. Apply with chisels spaced 12 inches apart to a depth of 6 to 8 inches and seal immediately with 4 mil polyethylene. Apply the product at the rate shown on the appropriate table for the product of choice. Expose to fumigation for 96 hours. This treatment will control disease to a depth of 4 feet.

# HAZARDS TO HUMANS AND DOMESTIC ANIMALS

## DANGER

Extremely hazardous liquid and vapor under pressure. Do not breathe vapor. Inhalation may be fatal or cause serious acute illness or delayed lung, nerve or brain injury. 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.

This product contains chloropicrin which may be irritating to the upper respiratory tract, and cause painful irritation to the eyes, producing watering. If these symptoms occur, leave the fumigation area immediately.

**RESPIRATORY PROTECTION:** Under normal conditions of use, no respiratory protection will be required. However, the following information regarding respiratory protection should be known. If the concentration of methyl bromide and chloropicrin in the worker area, as measured by a pump and the appropriate detector tubes (for example, Draeger, Kitagawa, MSA, and Sensidyne), does not exceed 5 ppm (20 mg/M<sup>3</sup>) for methyl bromide or 0.1 ppm (0.3 mg/M<sup>3</sup>) chloropicrin, no respiratory protection is required. If these concentrations are exceeded at any time, or the concentration is unknown, all persons in the fumigation area must wear a NIOSH (MSHA) approved self-contained breathing apparatus (SCBA) or combination air supplied SCBA respirator or evacuate the area. Protective clothing is required to be worn any time respiratory protection is required. Because there is always a possibility of a spill or leak, the SPILL AND LEAK PROCEDURES under STORAGE, HANDLING AND DISPOSAL must be understood and followed.

**PROTECTIVE CLOTHING:** Methyl bromide and chloropicrin may be trapped inside clothing and cause skin injury. Wear loose, long sleeved shirts, long trousers and socks that are cleaned after each wearing, or disposable clothing. Do not wear jewelry, gloves or other gas confining apparel. If full face respiratory protection is not required, wear a full face shield for eye protection when handling liquid fumigant. After exposure, immediately remove clothing, shoes and socks. Do not reuse contaminated clothing until thoroughly decontaminated by airing and washing. Drenched shoes cannot be adequately decontaminated and should be disposed of properly.

**POSTING OR PLACARDING REQUIREMENT:** The applicator must placard or post all entrances to the fumigated area with sign bearing in English and Spanish.

Since this detector cannot normally detect methyl bromide concentrations below 50 ppm, while the TCV is 5 ppm, this detector should not be used to determine appropriate respiratory protection or the adequacy of aeration. The following tabulation gives the approximate methyl bromide concentration associated with color intensity in the flame. During use at night the flame has a bluish cast which has to be taken into consideration, otherwise the color changes are the same.

This Product ppm (mg/M <sup>3</sup> )	Pounds per 10000 cu. ft. (lb)	Flame Color in Daylight
0	0	No color
25	0.00025	Faint fringe of green
50	0.0125	Moderate green
75	0.031	Green
250	0.0625	Strong green
500	0.125	Strong green-blue fringe
800	0.20	Strong blue-green
1000	0.25	Blue

### Chemical And Physical Properties for Methyl Bromide and Chloropicrin

Property	Methyl Bromide	Chloropicrin
Formula	CH <sub>3</sub> Br	CCl <sub>3</sub> NO <sub>2</sub>
Color	Colorless to light yellow	Clear, colorless
Physical State	Gas at 25°C, Liquid under pressure	Only liquid
Odor	Odorless	Strong smelling, causes tears
Flammability	Nonflammable	Nonflammable
Explosibility	Nonexplosive	Nonexplosive
Boiling Point	3.6°C (38.5°F)	112.4°C (220°F)
Freezing Point	-93°C (-135.4°F)	-64°C (83.2°F)
Density of Liquid at 15°C	1.732 gm/ml	1.65 gm/ml

**BEST AVAILABLE COPY**

# PRECAUTIONARY STATEMENTS

## HAZARDS TO HUMANS AND DOMESTIC ANIMALS

### DANGER

Extremely hazardous liquid and vapor under pressure. Do not breathe vapor. Inhalation may be fatal or cause serious acute illness or delayed lung, nerve or brain injury. 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.

This product contains chloropicrin which may be irritating to the upper respiratory tract, and cause painful irritation to the eyes, producing watering. If these symptoms occur, leave the fumigation area immediately.

**RESPIRATORY PROTECTION.** Under normal conditions of use, no respiratory protection will be required. However, the following information regarding respiratory protection should be known: If the concentration of methyl bromide and chloropicrin in the worker area, as measured by a pump and the appropriate detector tubes (for example, Draeger, Kitagawa, MSA, and Sensidyne), does not exceed 5 ppm (10 mg/M<sup>3</sup>) for methyl bromide or 0.1 ppm (0.3 mg/M<sup>3</sup>) chloropicrin, no respiratory protection is required. If these concentrations are exceeded at any time, or the concentration is unknown, all persons in the fumigation area must wear a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air supplied SCBA respirator or evacuate the area. Protective clothing is required to be worn any time respiratory protection is required. Because there is always a possibility of a spill or leak, the SPILL AND LEAK PROCEDURES under STORAGE, HANDLING AND DISPOSAL must be understood and followed.

**PROTECTIVE CLOTHING.** Methyl bromide and chloropicrin may be trapped inside clothing and cause skin injury. Wear loose, long sleeved shirts, long trousers and socks that are cleaned after each wearing, or disposable clothing. Do not wear jewelry, gloves or other gas confining apparel. If full face respiratory protection is not required, wear a full face shield for eye protection when handling liquid fumigant. After exposure, immediately remove clothing, shoes and socks. Do not reuse contaminated clothing until thoroughly decontaminated by airing and washing. Drenched shoes cannot be adequately decontaminated and should be disposed of properly.

**POSTING OR PLACARDING REQUIREMENT:** The applicator must placard or post all entrances to the fumigated area with signs bearing, in English and Spanish:

1. The signal word DANGER, PELIGRO and the skull and cross-bones symbol.
2. The statement, "Area under fumigation, DO NOT ENTER, NO ENTREAR."
3. The date of fumigation.
4. Name of fumigant used, i.e., methyl bromide with chloropicrin.
5. Name, address, and telephone number of the applicator.
6. Additional information required by local or state regulations.

Only a certified applicator or someone under his/her supervision may remove placards and only when the concentration of methyl bromide in the treated site is below 5 ppm and chloropicrin is below 0.1 ppm.

**ENVIRONMENTAL HAZARDS.** This pesticide is toxic to wildlife. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

**PHYSICAL HAZARDS.** Contents under pressure. Do not use or store near heat or open flame. Do not puncture or incinerate container. Exposure to temperatures above 130°F may cause bursting.

**CHEMICAL HAZARDS.** This product is nonflammable. There is no danger from fire or explosion in use concentrations. However, flames and other heat sources above 300°F can cause degradation of this product to liberate toxic and corrosive gases. The use of this product with aluminum, magnesium, zinc, and alkali metals will result in the liberation of toxic gases, and possible fire and explosion. In addition, severe corrosion of containers and equipment made of these metals may occur.

## 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 should be used only by individuals trained in its proper use. Before using, read and follow all label precautions and directions.

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

This product is to be used only for pre-plant soil fumigation.

Extreme caution should be taken when fumigating next to fields with animals or valuable crops, or next to buildings inhabited by humans or animals.

## STORAGE, HANDLING, AND DISPOSAL

**CYLINDER STORAGE AND HANDLING.** Store in a locked, dry, cool, 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, lugs, or similar devices to move 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, use valve stem safety cap onto valve outlet, and replace protective bonnet before returning to shipper. Only the registrant, or his designee is authorized to refill cylinders. Do not use cylinders for any other purpose.

**DISPOSAL - Pesticides.** Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide or mixture is a violation of Federal law. If these wastes cannot be disposed of by use of the following instructions, contact your state, local, or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**Cylinders:** Cylinders remain the property of Van Waters & Rogers Inc. Any empty, defective and unneeded cylinders should be returned to Van Waters & Rogers Inc. at the local office, 11111 41st, 8700 to arrange for pick up. Credit will be issued for partial cylinders. Do not store cylinders with their safety caps and pressure bonnets.

**SPILL AND LEAK PROCEDURES.** Evacuate immediate area of spill or leak. Do not permit re-entry into spill area by unprotected persons until the concentrations are determined to be less than 5 ppm for methyl bromide and 0.1 ppm for chloropicrin. Notify. Applying water traps is of this product to mitigate detection of spilled material, increases the product's evaporation time and spreads contamination. If leak occurs while cylinder is on tractor, the rupture of hose or fitting, immediately stop tractor and motor. Use NIOSH/MSHA approved self-contained SCBA or combination air supplied SCBA respirator for entry into affected area to correct problem. Move leaking or damaged cylinders outdoors or to an isolated location, observing strict safety precautions. Work upward if possible. Allow spill to evaporate. Because of the high percentage of chloropicrin (boiling point 220°F) in this product this may take some time. Increasing the air flow and/or temperature in the area of the spill will speed up the evaporation process. Alternatively, a leaking cylinder may be removed to an isolated area and the contents discharged under a sheet of 4 mil or greater thickness into the soil surface in accordance with instructions under Soil Fumigation Directions. Contaminated soil, water, and other

The Halide Leak Detector. This detector is useful in detecting gross leaks of this product such as around taping and taping. Since the detector cannot normally detect methyl bromide concentrations below 50 ppm, while the TLV is 5 ppm, this detector should not be used to determine appropriate respiratory protection or the adequacy of aeration. The following table gives the approximate methyl bromide concentration associated with color intensity in the flame during use at night. The flame has a bluish cast which has to be taken into consideration, otherwise the color changes are the same.

TLV Product (ppm Present)	Pounds per 1000 cubic feet	Flame Color in Daylight
0	0	No color
25	0.00625	Faint fringe of green
50	0.0125	Moderate green
125	0.031	Green
250	0.0625	Strong green
500	0.125	Strong green-blue fringe
800	0.20	Strong blue-green
1000	0.25	Blue

## Chemical And Physical Properties for Methyl Bromide and Chloropicrin

Property	Methyl Bromide	Chloropicrin
Formula	CH <sub>2</sub> Br	CCl <sub>3</sub> NO <sub>2</sub>
Color	Colorless to light yellow	Clear, colorless
Physical State	Gas at 25°C, liquid under pressure	Dry liquid
Odor	odorless	Strong irritating, causes tears
Flammability	nonflammable	nonflammable
Explosivity	nonexplosive	nonexplosive
Boiling Point	3.6°C (38.5°F)	112.4°C (227°F)
Freezing Point	-93°C (-135.4°F)	-64°C (83.2°F)
Density of Liquid (20°C)	1.712 g/ml	1.65 g/ml
Weight per Gallon (20°C)	14.4 lb	13.7 lb
Specific Gravity of Gas at 760 mm Hg (Air = 1.00)	3.27	5.7
Vapor Density (20°C (68°F))	0.247 lb/cu ft	—
Vapor Pressure (20°C (68°F))	1400 mm Hg	18.3 mm Hg
Solubility in Water	Very slight, forms a voluminous white precipitate with ice water	Slightly soluble

## NAMCO Pathofume 75 25 Rate, Exposure Table

TREATMENT SITE	RATE <sup>1</sup> & METHOD <sup>2</sup>	EXPOSURE TIME
Field soils to be planted to: Asparagus, broccoli, cauliflower, eggplant, lettuce <sup>3</sup> , mushrooms, onions (dry bulb) <sup>4</sup> , peppers, pineapples, strawberries, tomatoes	240-320 lb/A	24-48 hr
Florida Citrus <sup>5</sup>	1.5 lb/100 sq. ft.	24-48 hr
Nursery and greenhouse soils, seed and transplant beds and turf <sup>6</sup>	240-580 lb/A	24-48 hr
Non food crops	1.2 lb/100 sq. ft.	24-48 hr
Tobacco	240-580 lb/A	24-48 hr
Tomato (greenhouse crop)	240-580 lb/A	24-48 hr

## NAMCO Pathofume 57/43 Rate, Exposure Table

TREATMENT SITE	RATE <sup>1</sup> & METHOD <sup>2</sup>	EXPOSURE TIME
Field soils to be planted to: Asparagus, broccoli, cauliflower, eggplant, lettuce <sup>3</sup> , mushrooms, onions (dry bulb) <sup>4</sup> , peppers, pineapples, strawberries, tomatoes	315-420 lb/A	24-48 hr
Florida Citrus <sup>5</sup>	2 lb/100 sq. ft.	96 hr
Nursery and greenhouse soils, seed and transplant beds and turf <sup>6</sup>	315-760 lb/A	24-48 hr
Non food crops	1.8 lb/100 sq. ft.	24-48 hr
Tobacco	315-420 lb/A	24-48 hr
Tomato (greenhouse crop)	315-420 lb/A	24-48 hr

## NAMCO Pathofume B Rate, Exposure Table

TREATMENT SITE	RATE <sup>1</sup> & METHOD <sup>2</sup>	EXPOSURE TIME
Field soils to be planted to: Asparagus, broccoli, cauliflower, eggplant, lettuce <sup>3</sup> , mushrooms, onions (dry bulb) <sup>4</sup> , peppers, pineapples, strawberries, tomatoes	270-360 lb/A	24-48 hr
Florida Citrus <sup>5</sup>	1.5 lb/100 sq. ft.	24-48 hr
Nursery and greenhouse soils, seed and transplant beds and turf <sup>6</sup>	270-650 lb/A	24-48 hr
Non food crops	1.5 lb/100 sq. ft.	24-48 hr
Tobacco	270-360 lb/A	24-48 hr
Tomato (greenhouse crop)	270-360 lb/A	24-48 hr

## NAMCO Trifume Rate, Exposure Table

TREATMENT SITE	RATE <sup>1</sup> & METHOD <sup>2</sup>	EXPOSURE TIME
Field soils to be planted to: Asparagus, broccoli, cauliflower, eggplant, lettuce <sup>3</sup> , mushrooms, onions (dry bulb) <sup>4</sup> , peppers, pineapples, strawberries, tomatoes	400-530 lb/A	24-48 hr
Florida Citrus <sup>5</sup>	2 lb/100 sq. ft.	24-48 hr
Nursery and greenhouse soils, seed and transplant beds and turf <sup>6</sup>	400-970 lb/A	24-48 hr
Non food crops	2 lb/100 sq. ft.	24-48 hr
Tobacco	400-530 lb/A	24-48 hr
Tomato (greenhouse crop)	400-530 lb/A	24-48 hr

### Conditions of Sale and Warranty

The Directions for Use of this product reflect the opinion of experts based on field use and tests. The Directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness, or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application all of which are beyond the control of Van Waters & Rogers Inc. All such risks shall be assumed by the Buyer.

**SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THIS MATERIAL OR THE USE OF THIS PRODUCT OTHER THAN INDICATED ON THE LABEL. BUYER ASSUMES ALL RISK OF USE AND/OR HANDLING OF THIS MATERIAL WHEN SUCH USE OR HANDLING IS CONTRARY TO LABEL INSTRUCTIONS.**

### Residues and Tolerances

Any 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 at harvest, and it is the user's responsibility to see that there is no residue on such crops at harvest 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 at harvest. However, Van Waters & Rogers Inc. assumes no responsibility as to their accuracy nor for any loss due to excessive residues.

### Pests Controlled

This product is useful in controlling the following pests when present at the time of treatment:

Plant-parasitic nematodes, including root-knot, root lesion (meadow), cyst, citrus, burrowing, false root knot, urtic, spiral ring, sting, stubby root, dagger, and sheath and stunt (styles).

Soil-borne disease organisms including *Pythium*, *Rhizoctonia*, *Phytophthora*, *Pyrenochaeta*, *Sclerotinia*, *Sclerotium*, *Fusarium* and the clubroot organism, *Plasmodiophora*.

Weeds and weed seed, broadleaf weeds and grasses including quackgrass, annual bluegrass, barnum rope, common lambsquarters, torpedograss and Bermuda grass. While normally not effective against seeds of dodder, filaree, milkwe, morningglory and some species of clover, eric, and control may be obtained by using higher dosages and/or longer exposure periods.

Insects in the soil, including wire-worms, cutworms, grubs, rootworms, ants and garden symphylans.

### Treatment Conditions

**When to Treat:** Treatments can be made any time of year when soil conditions are suitable. In northern states, late summer or early fall treatments are best for land to be planted to early spring crops.

**Temperature Requirements:** Do not fumigate if the soil temperature is below 50°F. For the best results, fumigate when soil temperature is 60 to 80°F at the depth of 6 to 8 inches.

**Pre-treatment Soil Preparation:** Plow or rip or otherwise till the soil to the depth to which effective treatment is required. The soil should be worked until free of clods or large lumps. Residue from previous crops should be worked into the soil to allow for decomposition prior to fumigation. Soil moisture should be optimum for seed germination. Coarse textured soils can be fumigated with higher moisture content than fine textured soils. For best results soil should be kept moist for at least four days prior to treatment.

field soils to be planted to

Asparagus, brocoli, cauliflower, eggplant, lettuce <sup>1</sup> , muskmelons, onions (dry bulb) <sup>4</sup> , peppers, pineapples, strawberries, tomatoes	360-480 lb/A	24-48 hr
Florida Citrus <sup>5</sup>	2 to 100 sq. ft.	96 hr
Nursery and greenhouse soils, seed and transplant beds and turf		
Non-food crops	360-480 lb/A	24-48 hr
Tobacco	2 to 100 sq. ft.	24-48 hr
Tomato (greenhouse crop)	360-480 lb/A	24-48 hr

- 1 Use the higher rates in frier soils and those high in organic matter.
- 2 Methods of application is by injection with chisel plus covered with tarpaulin.
- 3 Use limited to one application in 2 to 3 years. Use limited to California only. Lettuce big vein is also controlled.
- 4 Onions (direct seeded/dry bulb). WENT of Rockies only. White rot is also controlled.
- 5 May not bear harvestable fruit within 24 months.
- 6 Seeds of certain weeds such as clover, morningglory, filaree, and others with hard seeds may require a higher dosage or a longer exposure period for effective control.

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