

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

1058  
Pm 32  
464-236

MAY 25 1989

Dr. Jeff Pinkham  
Dow Chemical U.S.A.  
P.O. Box 1706  
Midland, MI 48641-1706

Subject: Vikane  
EPA Registration No. 464-236  
General Label Revision, Residue Data,  
Instruction Manuals for Vikane Detector  
Devices and Additional Label Revisions  
Your Letters of August 14,  
September 4, and 18, 1987 and  
January 16, 1989

Dear Dr. Pinkham:

The reviews of the general label revision, residue data and instruction manuals for Vikane detector devices submitted in August and September 1987 in support of the reregistration of sulfuryl fluoride were inadvertently overlooked and were never transmitted to Dow. EPA regrets the delay in its response to your submissions.

The labeling included with your letter of January 16, 1989, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, is acceptable, subject to the following revisions. A stamped copy is enclosed for your records. Submit three copies of the finished printed labeling before this product is released for shipment.

1. Based on the data submitted, all references to sealing food, feed, drugs and medicinals in polyethylene bags must be removed from the labeling. Refer to the enclosed residue chemistry review of these data.

2. In insert 2 revise the statement, "Use chloropicrin as recommended..." to "Chloropicrin must be used as described..."

3. Add to insert 4 the following statements:  
"Sulfuryl fluoride is heavier than air and may be trapped inside and cause skin injury. Wear full body clothing and shoes or disposable protective clothing. Immediately after application, remove clothing, shoes and socks."

CONCURRENCES


SYMBOL							

4. While the term, "burns," is appropriate for the action of this chemical to exposed skin, EPA would have no objection if the references to "chemical burns" were revised in a manner similar to: "May cause burns by freezing of exposed skin..."

Information provided for the GF 1900 Vikane Analyzer, Miran Portable Infrared Gas Analyzer and Miran Infrared analyzers is incomplete and does not satisfy the requirements of our letter of May 22, 1987. At a minimum, the information should demonstrate the sensitivity, precision, accuracy, frequency, response, linearity in the range of the use, stability, effects of interfering substances, if any, durability of the instrument and ease of handling. This information must be submitted as soon as possible.

If you have questions about these comments, you may call Walter C. Francis at (703) 557-6909.

Sincerely,

  
Jeff Kempter  
Product Manager (32)  
Antimicrobial Program Branch  
Registration Division (H7504C)

H7505C:APB:WFrancis:wcf:Rm.711:557-6909:5-23-89

ACCEPTED

464-236

MAY 25 1989

UNDER THE FEDERAL INSECTICIDE  
FUNGICIDE AND RODENTICIDE ACT  
FOR ECONOMIC POISON REGISTERED  
ED UNDER NO. \_\_\_\_\_ SUBJECT  
TO ATTACHED COMMENTS.

# Specimen Label

## RESTRICTED USE PESTICIDE DUE TO INHALATION TOXICITY

For 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.

# VIKANE\*

## Gas Fumigant

BEST AVAILABLE COPY

TO CONTROL EXISTING INFESTATIONS OF INSECTS AND  
RELATED PESTS Such As (Or Including)

Drywood Termites, Formosan Termites, Powder Post Beetles, Old  
House Borers, Death Watch Beetles, Bedbugs, Clothes Moths, Carpet  
Beetles (Except Egg Stage), Cockroaches (Oriental, American,  
German, Brown-Banded), and Rodents (Rats, Mice).

IN: Dwellings (including mobile homes), Buildings, Construction Materials,  
Furnishings (household effects) and Vehicles including automobiles, buses,  
surface ships, rail cars, recreational vehicles (but not including aircraft).

When fumigating, observe local, state and federal rules and regulations  
including such things as odorization of areas being treated, ~~chip-~~  
~~fumigations~~, security requirements, and placement of warning signs.

Active Ingredient(s):

Sulfuryl Fluoride ..... 99%

Inert Ingredients

E.P.A. Registration No. 464-236 ..... 1%

E.P.A. Est. 464-CA-1

KEEP OUT OF REACH OF CHILDREN

**DANGER**  **POISON**

**PELIGRO:**

**PRECAUCION AL USUARIO:**

Si usted no lee inglés, no use este producto hasta que la  
etiqueta le haya sido explicada completamente.

**PRECAUTIONARY STATEMENTS**

**Hazards to Humans**

Extremely Hazardous Liquid And Vapor  
Under Pressure. • Inhalation Of Vapors May  
Be Fatal. • Liquid May Cause Chemical  
Burns Which May Have A Delayed Onset On  
May Freeze Exposed Skin. • Do Not Get In  
Eyes, On Skin Or On Clothing. • Sulfuryl  
Fluoride Is Odorless. • Exposure To Toxic  
Levels May Occur Without Warning Or  
Detection By The User.

**STATEMENTS OF PRACTICAL TREATMENT:** In all cases  
of overexposure, such as nausea, difficulty in breathing,  
abdominal pain, slowing of movements and speech,  
numbness in extremities, get medical attention immediately.  
Take person to a doctor or emergency treatment facility. If  
inhaled: Get exposed person to fresh air. Keep warm.  
Make sure person can breathe freely. If breathing has  
stopped, give artificial respiration by arm lift method. Not  
mouth-to-mouth resuscitation. Do not give anything by  
mouth to an unconscious person. If On Skin: Immediately

Do not put anything in the mouth of

remove contaminated clothing, shoes and other items  
covering skin. Wash contaminated skin area thoroughly with  
soap and water. If In Eyes: Flush with plenty of water. Get  
medical attention.

**NOTE TO PHYSICIAN:** Sulfuryl fluoride is a gas which has  
no warning properties such as odor or eye irritation.  
(Chloropicrin used as a warning indicator is also the active  
ingredient in tear gas and will cause tearing.) Early  
symptoms of exposure to sulfuryl fluoride are respiratory  
irritation and central nervous system depression. Excitation  
may follow. Slowed movement, reduced awareness and  
slow or garbled speech may be noted. Prolonged exposure  
can produce lung irritation, pulmonary edema, nausea and  
abdominal pain. Repeated exposure to high concentrations  
can result in significant lung and kidney damage. Single  
exposures at high concentrations have resulted in death.  
Treatment is symptomatic.

Liquid sulfuryl fluoride in the eye may cause damage due to  
freezing and/or chemical burns.

### NOTICE

Read and understand the entire label before using. Use only  
according to label directions.

Before buying or using this product, read "WARRANTY LIM-  
ITATIONS AND DISCLAIMER" elsewhere on the label. If  
terms are not acceptable, return unopened package at once  
to seller for full refund of purchase price paid. Otherwise, use  
by the buyer or any other user constitutes acceptance of the  
terms under WARRANTY LIMITATIONS AND DISCLAIMER.

### IN CASE OF AN EMERGENCY

endangering life or property involving this  
product, call collect 517-636-4400

\*  
**VIKANE**

DELETE OK

or shower

for at least  
five minutes.

refrigeration  
or

DELETE

No, DELETE

How about  
may cause burns  
by freezing of  
exposed skin.  
or "may cause  
frostbite"

OK

**BEST AVAILABLE COPY**

*This is previous insert  
to be better than this:  
Chloropicrin must be used as described...*

4. 8

## DIRECTIONS FOR USE

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

## GENERAL INFORMATION

Before using read and follow all label precautions and directions

This fumigant is a highly hazardous material and should be used only by individuals knowledgeable of the hazards of this chemical and trained in the use of required respiratory equipment, detector devices, emergency procedures, and the proper use of this fumigant

When used for fumigation of enclosed spaces such as houses and other structures, warehouses, vaults, chambers, trucks, vans, boxcars, ships, and other transport vehicles, two persons trained in the use of this product must be present at all times during introduction of fumigant, testing, and aeration periods.

Do not apply below 40°F

Remove edible items from the structure before the fumigation if they cannot be adequately sealed to prevent exposure to sulfuryl fluoride. Use chloropicrin as recommended on the label to ensure evacuation of structures by humans or animals before fumigation

## PREPARATION FOR FUMIGATION

**Structural Fumigations:** Remove from the structure to be fumigated all persons, domestic animals, pets - including fish and desirable growing plants. Remove mattresses and pillows completely enveloped in water proof covers or remove covers. Food, feed, drugs and medicinals (including those items in refrigerators and freezers) must be removed from fumigation site or sealed in highly resistant containers such as glass, metal or plastic such as polyethylene plastic bags of at least 4 mil thickness or equivalent such as two 2-mil bags.

**EXTINGUISH ALL FLAMES, INCLUDING PILOT LIGHTS OF HOT WATER HEATERS, GAS REFRIGERATORS, RANGES, OVENS, BROILERS, ETC. TURN OFF OR UNPLUG ALL ELECTRICAL HEATING ELEMENTS SUCH AS THOSE IN HEATERS, PIANOS, ORGANS, ETC. SHUT OFF AUTOMATIC SWITCH CONTROLS FOR APPLIANCES AND LIGHTING SYSTEMS WHICH WILL BE INCLUDED IN THE SPACE TO BE FUMIGATED.**

Internal doors and internal openings to attics and subareas should be open. Open storage chests, cabinets, drawers and closets. Provide for forced distribution of gas and aeration in basements or other dead air spaces.

Provide for forced air circulation using electric fan(s) to facilitate rapid dispersion of gas.

**Tarpaulin Fumigations:** Open operable windows. When tarping use a highly resistant material such as a vinyl coated nylon, or polyethylene sheeting of at least 4 mil thickness. Seal all seams. Seal all low edges of the cover (such as with soil, sand, or weighted "snakes") To minimize escape of gas through the soil and to avoid injury to nearby plants, wet soil outward from foundation to the cover if not sufficiently moist to act as a barrier for the gas.

**Taped Fumigations:** For fumigation sites that can be paper or tape sealed, seal adequately around doors, windows, vents, and other openings.

**Chamber Fumigation:** For chamber fumigation use gas tight chamber with adequate circulation.

**Construction Materials, Furnishings (Household effects) and Vehicles:** Follow preparations as appropriate in above for chamber, taped jobs or tarpaulin fumigations to assure good confinement of the gas for the recommended period of exposure

**Fumigation of Surface Ships in Port:** Surface ships in size up to and including large ocean-going ships may be fumigated with VIKANE to control the various pests listed. The professional fumigator and the ship's captain (or owner) shall follow all applicable regulations including those listed in the Department of Transportation Chapter 1 Parts 147A 1-147A 43. No people, plants, or pets may be on board during fumigation.

The person responsible for the fumigation must notify the master of the vessel, or his representative, of the requirements relating to personal protection equipment and detection equipment. 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

If leakage of the fumigant is detected, the person in charge of the fumigation shall take action to correct the leakage, or shall inform the master of the vessel, or his representative, of the leakage so that corrective action can be taken

Edible commodities shall not be exposed to the chemical. If not removed from the vessel they shall be protected from exposure. The vessel must not be moved during the fumigation and aeration periods. If re-entry is necessary before aeration is completed, positive pressure self-contained respiratory protection must be worn

**WARNING AGENT:** To aid in vacating, 5-10 minutes prior to fumigation, place a handful of cotton in a shallow container and set the container in the air stream of a fan. Pour chloropicrin over the cotton. Use 1 fluid oz/10,000 to 15,000 cubic feet - (30 ml/283 to 425 cubic meters) of space to be fumigated

Chloropicrin is registered as a restricted use pesticide, whose properties and effects are different from those of sulfuryl fluoride. It causes smarting of the eyes, tears, discomfort, and has a very disagreeable pungent odor at very low concentrations. Fumigators using chloropicrin as a warning agent prior to fumigation of habitable structures must be certified to do so or under the supervision of a certified pesticide applicator. Fumigators must use a chloropicrin product registered for this purpose, and observe the precautionary statements and safety recommendations appearing on the EPA approved label for this product

**Protective Clothing:** Wear full-body clothing and shoes that are cleaned after each wearing or disposable protective clothing. Do not wear gloves or rubber boots. Sulfuryl fluoride is heavier than air and may be trapped inside and cause skin injury. If full-face respiratory protection is not required, wear goggles or full face shield for eye protection when handling liquid.

**Respiratory Protection:** If the concentration of sulfuryl fluoride in the working area, as measured by a detector device with sufficient sensitivity such as an INTERSCAN or MIRAN gas analyzer, does not exceed 5 ppm (20 mg/cubic meter), no respiratory protection is required. When this concentration is exceeded, all persons in the exposed area must wear a NIOSH or MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA/respirator, such as manufactured by Scott or MSA. Before using any make or brand of SCBA, learn how to use it correctly. Determine that it has an adequate air supply for the job at hand, that it fits properly, providing an adequate seal around the face and that it is in good working order. For more detailed information on the source and use of air monitoring devices and respirators, consult the VIKANE Fumigation Manual.

**Prefumigation Check:** Check for leaks.

**DOSAGE AND EXPOSURE TIME:** For fumigation to control drywood termites and non-egg stages of other insect and related structural and household pests, the FUMIGUIDE<sup>®</sup> calculator(s) is to be used for the coordination of fumigant rates with soil or slab temperature, exposure period, and fumigant loss rate measured as half-loss-time (HLT). When control of the egg stage is also desirable, use the indicated multiple factor of the drywood termite dosage (as determined by Fumiguides) for pests listed in the following table.

OK INSERT 1

INSERT 2

(except waterbeds)

OK INSERT 3

plastic,

*Their old inserts 9x10 were better than they are*

INSERT 4 Needs changes shown on insert.

unmonitored structures to coordinate

INSERT 5

Pest	Dosage to be used (as a Multiple of Drywood Termite Dosage)
Carpet Beetles** Rodents (rats, mice), and Cockroaches	1
Bed bugs	2
Old house Borers and Formosan Termites	4
Clothes Moths	6
Powder Post Beetles and Death Watch Beetles	10

These dosages apply to dwellings, buildings, construction materials, furnishings, and vehicles

\*\*\* More than one fumigation may be needed to control the infestation after egg hatch

INSERT 6

FUMGUIDE B calculator is to be used for coordination of fumigant rates with temperatures, a 20 to 24 hour exposure period, and an estimated HLT

FUMGUIDE Y calculator is used when fumigant concentrations are monitored and/or there are measured variations in exposure time

These calculators and referenced literature may be obtained from The Dow Chemical Company

**INTRODUCING THE FUMIGANT:** Release the fumigant from outside the structure, tent or vehicle. (Where this practice is not feasible, consult regulatory agency(s) and The Dow Chemical Company.) Release fumigant through a suitable leak-proof tube with a minimum burst pressure of 500 psi.

Direct the fumigant into the blast of air from a fan(s) of a total capacity of 1,000 cfm for each pound VIKANE shot per minute. Corrosion of metals can occur if insufficient fan capacity is used for rate of VIKANE shot. The release point should be into a large open space(s) in the fumigation site. **TO PREVENT DAMAGE, DO NOT APPLY FUMIGANT DIRECTLY TO ANY SURFACES.**

**Placarding of Fumigated Areas:** The applicator must placard or post all entrances to the fumigated areas with signs bearing, in English and Spanish

- 1 The signal word DANGER PELIGRO and the SKULL and CROSSBONES symbol
- 2 The statement Area under fumigation DO NOT ENTER/NO ENTRE
- 3 The date of fumigation
- 4 Name of fumigant used
- 5 Name, address and telephone number of the applicator

Only a certified applicator may remove placard, and only when the concentration of sulfuryl fluoride in the treated site or commodity is 5 ppm or less.

**Aeration and Reentry:** At the end of the exposure period remove all tarps and seals and open operable doors and windows. Fans can be used to help remove fumigant from spaces difficult to aerate. After fumigation, treated areas must be aerated until the level of sulfuryl fluoride is 5 ppm or less, as measured by a detection device with sufficient sensitivity such as an INTERSCAN or MIRAN gas analyzer. No one should enter treated areas if the level of sulfuryl fluoride is above 5 ppm unless provided with a respiratory protection device (SCBA or combination air supplied/SCBA respirator), such as manufactured by Scott or MSA. For more detailed information on the source and use of air monitoring devices or respirators, consult the VIKANE Fumigation Manual. Do not reoccupy fumigation site, i.e. building, ship, vehicle or chamber, nor move vehicle until aeration is complete. Warning signs must remain posted until aeration is determined to be complete.

## Storage and Handling

Store in dry, cool, well ventilated area under lock and key. Post as a pesticide storage area. Do not contaminate water, food, or feed by storage.

Store cylinders upright, secured to a rack or wall to prevent tipping. Cylinders should not be subjected to rough handling or mechanical shock such as dropping, bumping, dragging, or sliding. Do not use rope slings, hooks, tongs or similar devices to unload cylinders. Transport cylinders using hand truck or fork truck to which the cylinder can be firmly secured. Do not transport any cylinders in closed vehicles where they occupy the same common airspace as personnel. Transport securely only in an upright position.

Do not remove valve protection bonnet and safety cap until immediately before use. Replace safety cap, and valve protection bonnet when cylinder is not in use.

When cylinder is empty, close valve, screw safety cap onto valve outlet and replace protection bonnet before returning to shipper. Only the registrant is authorized to refill cylinders. Do not use cylinders for any other purpose. Follow registrant's instructions for return of empty or partially empty cylinders.

**Leak Procedures:** Evacuate immediate area of leak. Use SCBA or combination air-supplied/SCBA respirator, such as manufactured by Scott or MSA, for entry into affected areas to correct problem. Move leaking or damaged cylinder outdoors or to an isolated location, observing strict safety precautions. Work upwind if possible. Do not permit entry into leakage area by unprotected persons until concentration of fumigant is determined to be less than 5 ppm, as determined by a detection device with sufficient sensitivity such as an INTERSCAN or MIRAN gas analyzer. For more detailed information on the source and use of air monitoring devices or respirators, consult the VIKANE Fumigation Manual.

## CYLINDER AND PRODUCT DISPOSAL

Promptly return all empty cylinders to your distributor of VIKANE. Follow proper cylinder handling directions above.

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, consult your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

directions  
for use,

VIKANE CALCULATOR is a hand held microprocessor which performs the functions of both the FUMGUIDE B and Y calculators and includes Relative Humidity as a calculating factor.

## WARRANTY LIMITATIONS AND DISCLAIMER

The Dow Chemical Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions therein under normal conditions of use. THIS IS THE ONLY WARRANTY MADE ON THIS PRODUCT. NO OTHER EXPRESS AND NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE OUTSIDE OF THIS LABEL. Therefore, neither this warranty nor any other warranty of merchantability or fitness for a particular purpose express or implied extends to the use of this product contrary to label instructions (including conditions noted on the label such as unfavorable temperatures, soil conditions, etc.), under abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes, etc.) or under conditions not reasonably foreseeable to or beyond the control of seller.

When buyer or user suffers losses or damages resulting from the use or handling of this product (including claims based on contract, negligence, strict liability, or other legal theories), buyer or user must promptly notify in writing The Dow Chemical Company of any claims to be eligible to receive either remedy given below. The EXCLUSIVE REMEDY OF THE BUYER OR USER and the LIMIT OF LIABILITY of The Dow Chemical Company or any other seller will be one of the following, at the election of The Dow Chemical Company:

- (1) Refund of purchase price paid by buyer or user for product bought, or
- (2) Replacement of amount of product used.

The seller will not be liable for consequential or incidental damages or losses.

The terms of this Warranty Limitations And Disclaimer cannot be varied by any written or verbal statements or agreements. Any employee or sales agent of the seller is not authorized to vary or exceed the terms of this Warranty Limitations And Disclaimer in any manner.

**DIAMOND: NON-FLAMMABLE GAS  
(WITH NUMBER)**

**SULFURYL FLUORIDE  
UN2191**

**56.70 kg/125 lb weight net**  
91503-L2 U687



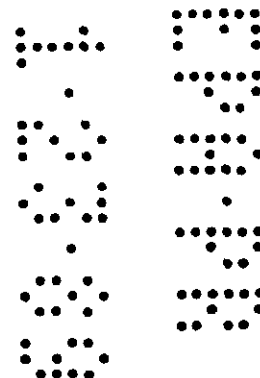
**THE DOW CHEMICAL COMPANY**  
Midland, Michigan 48674 U.S.A.

\* Trademark of THE DOW CHEMICAL COMPANY

Page 4.

SPECIMEN LABEL 86-1156 DATE CODE U687  
REPLACES 86-1156 DATE CODE T386  
DISCARD PREVIOUS SPECIMEN LABELS

REVISIONS INCLUDE:  
1) REVISED CYLINDER AND PRODUCT DISPOSAL SECTION  
2) CLARIFICATION OF USE DIRECTIONS  
3) ADDITIONAL DETECTOR DEVICES CITED  
4) DELETE REFERENCE TO COMMODITY APPLICATION  
5) ADDITION TO NOTE TO PHYSICIAN SECTION



**BEST AVAILABLE COPY**

**Insert 1**

When fumigating a single unit/room within or connected to a larger structure (such as townhouses, apartments, condominiums), all units of the entire structure must be vacated during the fumigation and aeration periods.

**Insert 2**

If fumigating for insect pests, do not apply when temperature at site of pest activity is below 40°F. This temperature may be measured at the slab foundation, sub-floor soil, or where ever the coolest part of the structure may be.

**Insert 3**

Open internal doors, internal openings to attics and subareas, storage chests, cabinets, drawers, closets, and appliances (such as washers, dishwashers, dryers, microwave or conventional ovens, etc.). Using electric fan(s) will help provide for forced distribution and aeration of gas in basements and other dead air spaces to facilitate rapid dispersion of gas. Refrigerator and freezer doors may be left open if the units are turned off or disconnected and all food items have been removed. If the applicator chooses to leave sealed food items in closed refrigerators or freezers during the fumigation, the appliances should be opened when clearing the structure until the air in them is below 5 ppm.

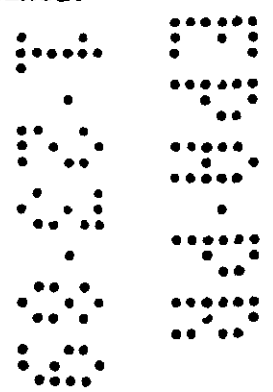
*SP is heavier than air and may be trapped inside and cause skin injury. Wear full-body clothing and shoes or disposable protective clothing. Immediately after application, remove clothing, shoes and socks.*

**Insert 4**

**Protective Clothing:** Wear goggles or full face shield for eye protection during introduction of the fumigant. Do not wear gloves or rubber boots. Do not reuse clothing or shoes that have become contaminated with liquid VIKANE until thoroughly aerated and cleaned.

**Insert 5**

Pest	Dosage Factor
Rodents** .....	1/2X
Carpet Beetles*** and Cockroaches .....	1X
Furniture Carpet Beetles*** and Bedbugs.....	2X
Old House Borers and Formosan Termites .....	4X
Clothes Moths .....	6X
Powder Post Beetles and Death Watch Beetles ...	10X



\*\* To determine the proper dose for rodent control, use 80°F as the calculating temperature. Unlike insects, rodents are warm blooded and do not require increased dosages at lower temperatures.

~~For use only~~

8082

# Insert 6

For fumigation to control rodents, use sufficient gas to accumulate at least 36 ounce-hours following equilibrium, regardless of ambient air temperature. Refer to the VIKANE Fumigation Manual.

