

INSTRUCTIONS
FOR INTRANSIT
FUMIGATION OF
SHIP HOLDS
WITH

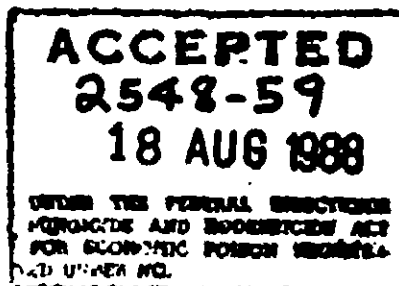
Detia(R)

GAS EX-B

RESTRICTED USE PESTICIDE
DUE TO ACUTE INHALATION TOXICITY OF HIGHLY
TOXIC HYDROGEN PHOSPHIDE (PHOSPHINE, PH₃) GAS

For retail sale to and use only by certified applicators for those uses covered by the applicator's certification or persons trained in accordance with the product manual working under the direct supervision and in the physical presence of the certified applicator. Physical presence means on site or on the premises. Read and follow the label and the Research Products Company product manual which contains complete instructions for the safe use of this pesticide.

EPA Establishment No. 33982WG01
EPA Registration No. 2548-59



BEST AVAILABLE COPY

01700 P

01800 II a. Introduction

01850

01900

01950

02000

02050

02100

02150

02200

02250

02300

02350

02400 II b. General Information

02500

02550

02600

02650

02700

02750 II

02800

02850

02900

02950

03000

03050

03100

03150

03200

03250

03300

03350

03400

03450

03500

03550

03600

03650

03700

03750

03800

03850

03900

03950

04000

04050

04100

04150

04200

04250

04300

04350 II c. Pre-Voyage Fumigation Procedures and Precautions:

04400

04450

04500

Detia(R) GAS EX-B is a fumigant preparation containing 57% aluminum phosphide (by weight) which when removed from its original container will liberate hydrogen phosphide (phosphine). The reaction between atmospheric moisture and aluminum phosphide which produces hydrogen phosphide will continue for several days depending on temperature and humidity to which the preparation is exposed. To be effective the cargo holds or tanks should remain sealed for the duration of the voyage.

1. Shipboard fumigation is also regulated by the U. S. Coast Guard regulations 46 CFR 147A.
2. The United States Department of Agriculture, Federal Grain Inspection Services' Fumigation Handbook contains additional procedures which must be followed if infested bulk grain is to be fumigated to avoid the grain being designated "infested" or "weevily" by the Federal Grain Inspection Service or to obtain a U.S.D.A. phytosanitary certification. This handbook can also be followed voluntarily.
3. Detia(R) GAS EX-B (EPA Reg. No. 2548-59) is classified by the U. S. Environmental Protection Agency as a RESTRICTED USE PESTICIDE, DUE TO ACUTE INHALATION TOXICITY OF HIGHLY TOXIC HYDROGEN PHOSPHIDE (PHOSPHINE, PH₃) GAS. For retail sale to and use only by certified applicators for those uses covered by the applicator's certification or persons trained in accordance with the product manual working under the direct supervision and in the physical presence of the certified applicator. Physical presence means on site or on the premises. Read and follow the label and the Research Products Company product manual which contains complete instructions for the safe use of this pesticide.
4. This product is toxic to fish. Keep out of lakes, streams and other aquatic environments. Do not contaminate water by cleaning equipment or disposal of wastes.
5. For additional information refer to product label and the booklet entitled "Application Procedures for Detia(R) GAS EX-B."

Pre-Voyage Fumigation Procedures and Precautions:

1. Refer to and comply with the regulations and procedures

BEST AVAILABLE COPY

found in U. S. Coast Guard regulation, 46 CFR 147A.

2. Prior to fumigating a vessel for intransit cargo fumigation, the master of the vessel or his representative, and the fumigator must determine whether the vessel is suitably designed and configured so as to allow for safe occupancy by the ship's crew throughout the duration of the fumigation/voyage.

If it is determined that the design and configuration of the vessel does not allow for safe occupancy by the ship's crew throughout the duration of the fumigation/voyage, then the vessel will not be fumigated unless all crew members are removed from the vessel. The crew members will not be allowed to re-occupy the vessel until the vessel has been properly aerated and a determination has been made by the master of the vessel and the fumigator that the vessel is safe for occupancy.

3. The person responsible for the fumigation must notify the master of the vessel or his representative, of the requirements relating to personal protection equipment*, low range detection equipment and that a person qualified in the use of this equipment must accompany the vessel with cargo under fumigation. Emergency procedures, cargo ventilation, periodic monitoring and inspections, and first aid measures must be discussed with and understood by the master of the vessel or his representative.
4. Seal all openings to the cargo hold or tank using suitable, water proof, gas tight materials. Lock and/or otherwise secure all openings, manways, etc. used to enter the hold. Post appropriate "DANGER" placards on same.
5. On tankers the over-space pressure relief system of each tank must be sealed by (1) the closing of appropriate valves and (2) sealing the openings into the over-space with gas tight materials.
6. Contact appropriate authorities.
7. If the fumigation is not completed and the vessel aerated before the manned vessel leaves port, the person in charge of the vessel shall insure that at least two units of personal protection equipment and one gas or vapor detection device and a person qualified in their operation be on board the vessel during the voyage.
8. During the fumigation or until a manned vessel leaves port or the cargo is aerated, the person in charge of the fumigation shall insure that a qualified person

BEST AVAILABLE COPY

4069

07250
07300
07350
07400
07450
07500
07550
07600
07650
07700
07750
07800
07850
07900
07950
08000
08050
08100
08150
08200
08250
08300
08350
08400
08450
08500
08550
08600
08650
08700
08750
08800
08850
08900
08950
09000
09050
09100
09150
09200
09250
09300
09350
09400
09450
09500
09550
09600
09650
09700
09750
09800
09850
09900
09950

using gas or vapor detection equipment test spaces adjacent to the fumigated cargo area and all regularly occupied spaces for fumigant leakage.

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

9. Review with the master, or his representative, the voyage precautions and procedures.

*Personal protection equipment means a respirator or gas mask fitted with a canister designed for phosphine gas which is approved by NIOSH/MSHA. A gas mask and canister is approved for use up to 15 ppm. Above 15 ppm or at unknown concentrations a SCBA or its equivalent must be used.

U d. Procedures for Bulk Dry Cargo Vessels and Tankers:

1. Calculate dosage on the basis of cargo hold volume. Dosage is always calculated for total hold volume irrespective of the commodity tonnage in the hold.

Detia(R) GAS EX-B.....2-6 bags per 1000 cubic feet.

2. Procedure for Detia(R) GAS EX-B (Bag Blanket)

(a) After a hold has been filled or completed, dig a shallow trench approximately 15 feet long and 2 feet wide for each blanket being used. Maintain at least a two foot separation between trenches and stay in from side walls at least 10 feet.

(b) Open bag blanket containers one at a time; remove the blanket; unroll it until fully extended and position into the trench. Cover with the commodity.

3. Procedure for Detia(R) GAS EX-B (individual bags):
After a hold has been filled or completed, open containers and distribute bags uniformly onto commodity surface with spacing between each. Do not place bags within 10 feet of side walls. Step on each bag placement or probe bags into the commodity to depth desired.

4. Procedure for Detia(R) GAS EX-B (Bag Belt)
After a hold has been filled or completed, open containers and begin inserting (probing) bag belts into the commodity mass with spacing between. Do not probe within 10 feet of sidewalls. Attach a "locator" cord to

10000 each belt before insertion, leaving the loose end on the
10050 commodity surface.
10100

10150 5. Observe closing of hatch covers closely. Stop the
10200 closing if the cover snags a bag blanket, individual
10250 bag, or bag belt. Reposition the blanket, bag or belt
10300 and resume closing.
10350

10400 U e. Voyage Precautions and Procedures:
10450

10500 1. At regular intervals monitor spaces adjacent to areas
10550 containing fumigated cargo and all regularly occupied areas
10600 for fumigant leakage using appropriate gas detection
10650 equipment.
10700

10750 Special attention should be given to living quarters,
10800 kitchens, storerooms, mess halls, keel ducts, day rooms,
10850 the bridge, engine room and any other enclosed spaces
10900 occupied or frequented by crew members during a voyage.
10950

11000 2. If hydrogen phosphide is detected, evacuate the space or
11050 area, locate and seal off the source of the leak wearing
11100 appropriate respiratory protection equipment. Ventilate
11150 the area before allowing occupants to return.
11200

11250 3. Do not enter fumigated holds or tanks.
11300

11350 4. Do not open, ventilate or aerate the fumigated holds during
11400 the voyage.
11450
11500

11550 U f. Precautions and Procedures During Discharge:
11600

11650 If necessary to enter holds prior to discharge, test spaces
11700 directly above cargo surface for fumigant concentration,
11750 using appropriate gas detection and personal protection
11800 equipment. Do not allow entry into fumigated areas without
11850 personal protection equipment, unless fumigant
11900 concentrations are at safe levels, as indicated by a
12000 suitable detector.
12050
12100

12150 U g. Personal Protective Equipment and Monitoring:
12200

12250 1. Fully loaded holds on dry bulk carriers are considered
12300 an outdoor fumigation.
12350

12400 2. Tanker holds which must be entered to fumigate and
12450 partially loaded holds on dry bulk carriers are
12500 fumigated from within the area being treated.
12550

12600 3. See sections "I" and "H" on pages of the manual,
12650 titled "Application Procedures for Delia(R) GAS FX-H"
12700 for requirements.
12750
12800

4. If hydrogen phosphide is detected a minimum of two qualified persons on ship should wear the gas mask and canister described above while aerating the area and locating and sealing the leak.

Deactivation and Disposal of Detia(R) GAS EX-B

1. DISPOSAL OF UNREACTED OR PARTIALLY REACTED DETIA(R) GAS EX-B

Unreacted or partially reacted Detia(R) GAS EX-B can create a disposal hazard through over-exposure of workers to hydrogen phosphide gas or by spontaneous ignition of confined gas.

The following are deactivation and disposal instructions which are accepted in the United States of America. Consult pertinent government regulations before disposing of this product outside the U.S.A.

2. DISPOSAL OF Detia(R) GAS EX-B FOLLOWING A FUMIGATION

(a) General

If properly exposed, the bags remaining after a fumigation will contain grayish white, spent, nonhazardous waste and will contain only a small amount of unreacted aluminum phosphide. The long exposure period normally used for in transit ship hold fumigation is usually sufficient to adequately deactivate the fumigant. However, residual dust from incompletely exposed bags will require special care. Confinement of partially spent bags, as in a closed container may result in a fire hazard. Small amounts of hydrogen phosphide may be given off from the unreacted aluminum phosphide, and confinement of the gas may result in a flash. UNLESS IT CAN BE DETERMINED WITH CERTAINTY THAT THE BAGS ARE SPENT, THEY MUST BE DEACTIVATED AS DESCRIBED BELOW PRIOR TO DISPOSAL.

(b) Deactivation of Detia(R) GAS EX-B

(1) General

The methods below may be used for deactivating used or unused Detia(R) GAS EX-B regardless of the extent to which the aluminum phosphide has been consumed in the production of hydrogen phosphide.

(2) Dry Deactivation

Collect bags and place them into a ventilated, holding container such as the specially equipped drum illustrated below, or a wire cage used for other hydrogen phosphide fumigants or other similar device. Store the bags in one of these devices until the bags are spent. Unused or partially spent bags can be spread out on the ground in a secure open area away from occupied buildings to be deactivated by atmospheric moisture. Care should be

taken so that they are not carried away by the wind. Prior to final disposal, bags may be spread out in a single layer on the ground and covered with several inches of sand until they are spent. Bags that have not been exposed for the minimum times specified in the exposure guide on page should not be covered with sand. Dry deactivation is the recommended procedure for unused or partially spent bags. Ignition may occur if large numbers of incompletely reacted bags which are piled together are contacted by liquid water. This can occur in open storage containers. Therefore, such storage should be out of doors in a relatively isolated area protected from rain.

(3) Wet Deactivation - Method One

Fill an appropriate sized container with water a few inches from the top. Submerge bags for 36 hours. A metal grid works well to keep bags submerged. Do not cover container. Wear appropriate respiratory protection. This must be done outdoors or in front of an adequate fan that exhausts immediately outside. The water may be disposed of in a storm sewer or by pouring it out on the ground.

(4) Wet Deactivation - Method Two

Fill an appropriate sized metal container 2/3 full with water. For each gallon of water add 1/4 cup of low sudsing detergent or surfactant. Use no less than 1 gallon of water/detergent solution for 60 Detia(K) bags. Open each bag and dump the contents into the container as the water is stirred. Wear appropriate respiratory protection. DO NOT COVER THE CONTAINER AT ANY TIME. This must be done outdoors or in front of a adequate fan that exhausts immediately outside.

(c) Disposal Procedures

In open areas, small amounts (up to 7.0 kg.) of the spent bags may be disposed of on site by burial of the bags or by opening the bags and spreading the dust over the land surface away from inhabited buildings.

Spent bags may also be collected and disposed of at a sanitary landfill, approved pesticide incinerator or other approved sites or by other procedures approved by federal, state and local authorities.

Do not dispose of dust in toilet.

Dispose of the water/dust mixture (slurry) (with or

BEST AVAILABLE COPY

without preliminary pouring out of excess water) in a sanitary landfill or other suitable burial site approved by local authorities. Where permissible, the slurry may be poured out on the ground. If it is held 36 hours it may be poured into a storm sewer.

Never confine, partially spent bags or slurry in closed containers such as closed drums or plastic bags.

3. DISPOSAL DRUM

In lieu of immediate disposal it may be more practical to collect reacted or unreacted bags and place them into a specially designed drum as illustrated.

Note the cone shaped, vented lid as well as the expanded metal false floor, the 10, 2.5 cm diameter holes evenly spaced around the bottom, the 5, 2.5 cm diameter holes in the bottom (not shown) and the locking device. The purpose of the drum is to provide a central, known collection point for bags. When full or at regular intervals the reacted bags can be transported directly to an approved disposal site.

The drum should be located in an open, secured area marked as the collection center for Detia(R) GAS EX-B. We recommend the drum also be marked "DANGER, POISONOUS GAS, KEEP AWAY." If the drum is used only for reacted bags "POISONOUS GAS" can be deleted.

4. DISPOSAL OF CANS

Dispose of cans in a sanitary landfill or by other approved state or local procedures.

1. EXPOSURE GUIDELINES

This table lists the minimum conditions necessary prior to disposal of this fumigant. If these conditions are not met, the product must be deactivated as described above. In fact, the above procedures are recommended even when minimum conditions are met.

Please note that these exposure times are usually not sufficient

9-79

21000 to obtain adequate insect mortality when fumigating ship
 21050 holds, however voyages are usually long enough to provide
 21100 the desired insect mortality.
 21150

21200	TEMPERATURE* TO	EXPOSURE
21250	WHICH FUMIGANT	PERIOD
21300 U	IS EXPOSED	-----
21400		
21450	Below 4 C	Do Not Fumigate
21500	5 C - 9 C	14 days
21550	10 C - 15 C	9 days
21600	16 C - 25 C	5 days
21650	Above 25 C	3 days

*For this table to be valid Dettia(R) GAS EX-B must also be
 exposed to a minimum of 60% humidity. At lower humidities
 several days exposure must be added.

Research Products Company
 Div. of McShares, Inc.
 P. O. Box 1460
 Salina, KS 67402-1460
 (913) 825-2181
 Telex 417318 REPCO SAL

BEST AVAILABLE COPY