PRECAUTIONARY STATEMENTS

...a® Pellets react with atmospheric moisture to form and release the poisonous gas phosphine (Syn. Hydrogen phosphide). The reaction begins at first exposure to air. Atmospheric and/or commodity temperature dictates the rate and duration of the reaction.

HAZARDS TO HUMANS: DANGER

Avoid prolonged breathing of fumes in poorly ventilated areas. Preferably outside. Do not breathe vapors. Do not breathe dust. Do not get pellet dust in eyes or on hands, skin or clothing. Do not eat, drink or smoke while handling. Wash hands thoroughly with soap and water after handling. Have available a gas mask and canister approved by the U.S. Department of Interior, Bureau of Mines, for phosphine protection.

PHYSICAL OR CHEMICAL HAZARDS: Spontaneous ignition may result if pellets come into contact with water or other liquids. Phosphine reacts corrosively with copper, brass, gold and other precious metals.

SYMPTOMS OF PHOSPHINE POISONING: Sensation of cold, diarrhea, gastric pains, acute indigestion, dizziness, dry cough, loss of appetite, intense thirst, vomiting, enlarged pupils, choking attacks, reeling.

ANTIDOTE-FIRST AID: Any of the above may be taken as symptoms of phosphine poisoning. At first warning take victim to fresh air immediately. **CALL A DOCTOR!** Lay the victim down, keep warm with blankets. Supply pure oxygen and maintain respiration, artificially if necessary, until the doctor arrives. If the pellets or the pellet dust has been swallowed, call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger, or, if available, by administering syrup of ipecac. Do not induce vomiting or give anything by mouth to an unconscious person.

ENVIRONMENTAL HAZARDS

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.

SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, CONCERNING 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 AND/OR HANDLING IS CONTRARY TO LABEL INSTRUCTIONS.

RESTRICTED USE PESTICIDE

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

Detia®

PELLETS

A Fumigant For Use Against Listed Insects Which Infest Listed Raw Agricultural Commodities And Animal Feeds

Active Ingredient: Aluminum Phosphide	57%
Inert Ingredients:	43%
TOTAL	100%

KEEP OUT OF REACH OF CHILDREN

DANGER-POISON

Statement of Practical Treatment

If Swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger, or, if available, by administering syrup of ipecac. Do not induce vomiting or give anything by mouth to an unconscious person.

If Inhaled: Remove victim to fresh air, immobilize and keep warm. Sustain breathing artificially if necessary. CALL A PHYSICIAN IMMEDIATELY.

See Side Panels for Additional First Aid Procedures

Manufactured by: Detia Freyberg, GMBH
P.O. Box 9, 6941 Laudenbach I
F.R. of Germany

Distributed by: Research Products Company
Box 1057, Salina, Kansas 67401

EPA Establishment No. 33982WG01. EPA Registration No. 2648-63.

Net Contents: 1660 Pellets

Net Weight: 1000 grams (2 lbs. 3 26 oz.)

DIRECTIONS FOR USE

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

Refer to the instruction booklet titled "APPLICATION PROCEDURES FOR DETIA® PELLETS AND DETIA® TABLETS" for detailed use instructions. Used as directed therein Detia® Pellets will aid in the control of granary weevil, rice weevil, lesser grain borer, red flour beetle, Indian meal moth, saw toothed grain beetle, confused flour beetle, bean weevil and their pre-adult stages (egg-larvae-pupae).

STORAGE AND DISPOSAL

STORAGE: Store in dry, locked ventilated room or building. Protect from moisture, open flames, heat, acids and other chemicals. Never store near homes or living quarters.

PESTICIDE DISPOSAL

Pesticide or rinsate that cannot be used according to label instructions must be disposed of according to Federal, State or Local procedures under the Resource Conservation and Recovery Act.

DISPOSAL OF EMPTY CONTAINERS

METHOD 1: Triple rinse with soapy water (or equivalent) and offer for recycling or reconditioning, or dispose of in a sanitary landfill, or by other approved state and local procedures.

METHOD 2: Expose residual aluminum phosphide to atmospheric conditions as recommended in labeling. Dispose in a sanitary landfill or by other approved state and local procedures.

The booklets "APPLICATION PROCEDURES FOR DETIA® PELLETS AND DETIA® TABLETS" and "INSTRUCTIONS FOR INTRANSIT FUMIGATION OF SHIPHOLDS WITH DETIA® PELLETS AND DETIA® TABLETS" are a part of labeling. They contain specific use instructions concerning the fumigation of listed Raw Agricultural Commodities, Animal Feeds, Processed Foods, Non-Food Products and Stored Tobacco, information concerning dosage and exposure, and other information necessary to properly use Detia® Pellets.

CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. AS TO FIRE HAZARD ONLY WHEN USED SPECIFICALLY AS DIRECTED IN THE SEPARATE INSTRUCTIONS THAT ARE PART OF THE PRODUCT LABELING. DETIA® PELLETS ARE NONCOMBUSTIBLE BUT EXPOSURE TO MOIST AIR OR WATER RELEASES FLAMMABLE AND TOXIC PHOSPHINE GAS. SPONTANEOUS IGNITION MAY RESULT IF CONTACTED BY WATER, ACIDS OR CHEMICALS.

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ACCEPTED

JUN 9 1983

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 2648-63

Detia®

PELLETS

AND

Detia®

TABLETS

PHOSPHINE FUMIGANTS
FOR
USE AGAINST LISTED INSECTS
WHICH INFEST LISTED RAW AGRICULTURAL
COMMODITIES, ANIMAL FEEDS, PROCESSED FOODS,
NON-FOOD PRODUCTS, AND STORED TOBACCO

Research Products Company
P.O. Box 1057
1835 E. North St.
Salina, Kansas 67401

EPA Establishment No. 03982WG01
EPA Registration No. 2548-63
EPA Registration No. 2548-62

ACCEPTED
JUN 9 1983
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 2548-63

INTRODUCTION

The history of Detia® pesticides is long, dating back to the mid-1930's. In 1970 Detia® Gas EX-B was introduced into the United States. Detia® Tablets and Detia® Pellets were introduced in 1977. The manufacturer, Detia Freyberg GMBH, West Germany was the early pioneer in the development of phosphine as a fumigant.

Both Detia® Pellets and Detia® Tablets produce a poisonous and toxic gas. When used properly they are effective as an aid in controlling insect pests of stored raw agricultural commodities, processed foods, animal feeds and certain non-food products.

IMPORTANT

Detia® Tablets and Detia® Pellets are RESTRICTED USE PESTICIDES 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. Both the container label and this brochure should be read, studied and reviewed before using either Detia® Pellets or Detia® Tablets.

PRODUCT DESCRIPTION

Both DETIA® PELLETS and DETIA® TABLETS are a mixture of aluminum phosphide (57% by weight), ammonium carbamate and urea which is pressed into tablet and/or pellet form. The nearly spherical pellets are about 3/8" in diameter and weigh 0.6 grams each. The tablets are 4/5" in diameter and 1/5" thick and weigh 3.0 grams each. A pellet will produce about 0.2 grams hydrogen phosphide; the tablet about 1.0 gram. Both react with atmospheric moisture to produce hydrogen phosphide (PH_3) in the following way:

$$2\,AlP + 6\,H_2O \longrightarrow 2\,Al(OH)_3 + 2PH_3$$

Warm, humid air accelerates the reaction while cool, dry air has the opposite effect. After the reaction is completed a gray-white powder remains and consists mostly of aluminum oxide hydrate, aluminum oxide and a very small trace of unreacted, tightly bound aluminum phosphide.

WHAT IS HYDROGEN PHOSPHINE (PH_3)?

Hydrogen phosphide, more commonly referred to as phosphine, is a colorless, toxic gas with an odor like that of decaying fish, garlic or commercial carbide. It is very volatile with a high vapor pressure. The penetrating capability of hydrogen phosphide is great. The combination of high molecular activity, vapor pressure and toxicity to insects accounts for its wide acceptance as a fumigant. Residual tolerances have been established at 0.1 ppm for raw agricultural commodities and animal feeds at 0.01 ppm for processed foods.

USE PATTERN

Both pellets and tablets are registered with the U.S. Environmental Protection Agency for the post harvest fumigation of the commodities listed below as an aid in the control of granary weevil, rice weevil, maize weevil, lesser grain borer, saw-toothed grain beetle, confused flour beetle, Indian meal moth, angoumois grain moth, red flour beetle, bean weevil, cigarette beetle, cadelle, yellow meal worm, Mediterranean flour moth and dried fruit moth.

RAW AGRICULTURAL COMMODITIES:

Rice, Wheat, Barley, Corn, Oats, Sorghum, Millet, Rye, Popcorn, Soybeans, Cocoa Beans, Coffee Beans (raw), Filberts, Pecans, Pistachio Nuts, Walnuts, Cashews, Brazil Nuts, Almonds, Peanuts, Sunflower Seed, Cotton Seed, Safflower Seed, Seed and Pod Vegetables, (Adzuki Red Beans, Blackeyed Peas, Garbanzo Beans, Great Northern Beans, Green Split Peas, Lentils Peas, Lima Beans, Michigan Navy Beans, Moth Beans, Mung Beans, Pinto Beans, Split Urds), Sesame Seed, Flower Seed, Vegetable Seed, Grass Seed, Dates.

PROCESSED FOODS:

Cereal Flours and Milled Fractions, Soybean Flour and Milled Fractions, Polished Rice, Macaroni, Spaghetti, Noodles, Pasta, Malt (processed grains), Bakery mixes, Packaged Cereals, Pretzels, Oat Meal, Spices, Whole Wheat, Cream of Wheat, Processed Coffee/Tea (roasted-dried), Prepared Cocoa, Dried/Processed Meat-Fish-Cheese, Seasoning, Condiments (ground), Cookies, Crackers, Snack Foods, Herbs, Sugars-Candy Bars-Candy, Nondairy Creamers, Dried Powdered Milk, Processed Almonds, Brazil Nuts, Cashews, Filberts, Peanuts, Pecans, Pistachio Nuts, Walnuts, Dehydrated Potato Products, Dried Apples, Dried Peach .s, Dried Pears, Dried Spinach, Dried Carrots, Dried Eggs, Apricot Kernels, Primary Yeast, Dates, Figs, Prunes, Raisins, Sultanas, Dried Beans, Dried Lentils, Dried Peas.

ANIMAL FEED OR FEED INGREDIENTS

NON-FOOD PRODUCTS

Cotton (cloth and unprocessed), Feathers, Human Hair, Rubberized Hair, Vulcanized Hair, Mohair, Wool, Tobacco, Wood and Bamboo Products.

PRECAUTIONS

1. Dosage recommendations have been carefully calculated and should not be exceeded. It is important to realize that a shortened exposure period cannot be compensated for with an increased dosage.
2. Hydrogen phosphide is highly volatile and will penetrate through seemingly gas-tight materials such as concrete, given enough time. It is therefore imperative that adjoining rooms, bins, silos or other enclosed spaces be tested for phosphine while the fumigation is in progress before allowing occupancy.
3. In contact with water or other liquids, pellets and tablets can undergo spontaneous heating and ignition.

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4. The generation of hydrogen phosphide from both tablets and pellets is controlled by design. There is no safe way to accelerate the reaction.

5 Hydrogen phosphide reacts corrosively with copper, brass, gold, and various other metals. Thus, switch gear, communication devices, computers, calculators, small electric motors, etc. should be protected or removed before fumigation.

6. Pellets and/or tablets must not be used so that they or their reacted residues come into contact with any processed food with the EXCEPTION that both can be added directly to processed brewers rice, malt, and corn grits stored in breweries for use in the manufacture of beer.

7. Generally speaking, gas masks need not be actually worn during application. It is recommended, however, that gas masks be readily available for each worker and worn if phosphine is detected at a concentration that exceeds allowed limits.

EFFECTIVENESS - WHAT TO EXPECT

There is nothing absolute when it comes to predicting what percentage of an insect population will be killed as the result of fumigation. To expect a "100% kill", meaning all stages of insect life, is unrealistic and seldom achieved under practical field conditions. Literally interpreted a "100% kill" means every egg, larva, pupa and adult has been killed. A more realistic view is that something less than 100% of a given population will be killed. From a practical viewpoint it is not unreasonable to expect, say, a 95% kill. There will be times when effectiveness approaches 100% - there will be others when effectiveness is more on the order of 90%.

To fall much below 90% usually means that something unexpected happened such as the sudden appearance of a high sustained wind during the exposure period. Another example would be the unexpected interruption of a silo filling process whereby the silo was only, say 1/3 full when the process was stopped and not resumed. The net effect would be that of diluting the ultimate gas concentration to undesired levels.

The dosages for Detia® Pellets and Detia® Tablets are tied closely to exposure time and tightly sealed storage structures, and have taken into account many of the conditions normally found in the field. It would be impossible, however, to address every situation. In very unusual circumstances it would be best to consult with Research Products Company and determine if it is even possible to fumigate and expect good results. Depending on the exact situation it may mean transferring the commodity to a more suitable structure. In others it may mean selecting a more suitable fumigant.

Of critical importance is to meet minimum exposure requirements and whenever possible to exceed them. As a general rule the pre-adult stages are more difficult to kill than the adults. In this regard it is advantageous to lengthen exposure periods.

A WORD ABOUT SEALING AND PREPARATION

There are many factors affecting a fumigation but most are minor compared to sealing. Proper sealing is necessary to insure to the extent possible effective control of insects and to protect man and other forms of life from hydrogen phosphide during the fumigation.

In addition to proper sealing of the structure being fumigated, it will be necessary to post danger signs; have first aid information and proper respiratory protection equipment at the site; and be certain of application procedures and to employ only trained operators.

ABOUT DANGER SIGNS

Research Products Company furnishes signs that are considered appropriate. Refer to the illustration below.

Fumigated areas must be placarded on all entrances with signs containing at least the signal word "DANGER" and the Skull and Crossbones and the words "Area under fumigation, do not enter until completely aerated," the date of fumigation, name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector.

DANGER-POISON

KEEP AWAY

Area Under Fumigation, do not enter until completely aerated.

Date: By (name and address):

Phone: Fumigant:

All printing in red on white backing

Whether users make their own signs or obtain them from outside sources, the format and content of the illustrated placard should be followed.

SAFETY EQUIPMENT

It is normally not necessary to actually wear a gas mask when applying Detia® Pellets or Detia® Tablets because the initial gas release from either is delayed by design. However, suitable respiratory protection equipment should be immediately available and close by.

There are a number of suppliers of respiratory protection equipment. Irrespective of the supplier chosen, be certain to specify canisters for protection against phosphine gas. Consult your supplier concerning the limitations of the equipment selected.

NOTE: The use of respiratory protection equipment must comply with any and all Federal, State or local regulations. Consult the proper authorities for detailed information.

GAS DETECTION EQUIPMENT

All users of fumigants should have, as standard equipment, gas detection devices designed specifically for the type or kind of fumigant being used. And, they should establish inflexible policies concerning their routine use.

There are several reliable devices marketed. One of which is the Draeger MultiGas Detector. It is a portable, simple device and does not require intensive training or elaborate supporting equipment to operate. Furthermore it is inexpensively adaptable to remote monitoring procedures and will measure concentrations of phosphine in air in trace amounts of 0.1 ppm on up.

There are other devices equally as reliable. Consult your local suppliers of such equipment or contact Research Products Company for more information.

FIRST AID

HYDROGEN PHOSPHIDE IS TOXIC TO ALL FORMS OF ANIMAL LIFE. Exposure through inhalation produces clear symptoms of poisoning such as a pressing sensation in the chest, dizziness, nausea, vomiting, a prolonged feeling of faint and a rapid on-set of stupor. At the first warning that someone has been affected by phosphine—

1. Take the person to fresh air immediately and call a doctor.
2. Lay the person down and keep warm with blankets.
3. Maintain respiration, artificially if necessary.

If for some reason the pellets or tablets are swallowed symptoms of severe poisoning will be quickly noticed: Usually heavy vomiting followed by unconsciousness. Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger, or, if available, by administering syrup of Ipecac. REPEAT UNTIL VOMIT IS CLEAR. DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. DO NOT DELAY! TAKE THE PERSON TO A HOSPITAL AS FAST AS POSSIBLE. TAKE THIS BOOKLET WITH YOU AS WELL AS THE CONTAINER WITH THE LABEL INTACT. PRESENT BOTH TO THE ATTENDING PHYSICIANS.

NOTE TO PHYSICIAN

Complete rest for patient: 1-2 days-no activity-keep patient warm. Intravenous glucose injections (as normal practice) if patient suffers from nausea and vomiting. If, however, an increase in the blood-sugar is found, isotonic salt solutions (physiological salt - or Ringer's solution without glucose) must be injected instead.

Inhalation of oxygen or oxygen/carbon dioxide is usually successful. Use of cardiac and circulatory stimulants normally advisable.

In extremely serious cases of poisoning, blood transfusions are recommended. In no circumstances must an antidotal use be made of fats, oils (caster oil), butter, or milk.

Phosphine (PH_3) poisoning is not known to be chronic; phosphine action is reversible and symptoms will disappear by themselves.

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DOSAGE AND EXPOSURE

Dosage Guide: Very tight, well sealed structures can be fumigated with lower dosages than structures that are hard to seal and which are loose by virtue of their construction.

Pellets .....100-330 per 1000 cubic feet
Tablets .....20-66 per 1000 cubic feet

EXPOSURE GUIDE

The establishment of the proper exposure period is a critical determination. Both temperature and humidity influence the rate of phosphine production. The greater each is the faster the production of phosphine.

	Commodity Temperature (Farenheit)	Required Exposure Period
Pellets	Below 40°	Do Not Fumigate
	40°-53°	8 days (192 hrs)
	54°-59°	4 days (96 hrs)
	60°-68°	3 days (72 hrs)
	Above 68°	2 days (48 hrs)
Tablets	Below 40°	Do Not Fumigate
	40°-53°	10 days (240 hrs)
	54°-59°	5 days (120 hrs)
	60°-68°	4 days (96 hrs)
	Above 68°	3 days (72 hrs)

As stated the foregoing table is a guide. Whenever possible exposure periods should be lengthened and not shortened. The key to effective results lies with correct dosage, long exposure periods, proper application, and well sealed storage structures.

NOTE THAT NEITHER THE PELLETS NOR TABLETS SHOULD BE USED WHEN COMMODITY TEMPERATURES ARE BELOW 40° F.

APPLICATION PROCEDURES FOR BULK RAW AGRICULTURAL COMMODITIES, ANIMAL FEED, ANIMAL FEED INGREDIENTS, AND PROCESSED BREWERS RICE, MALT AND CORN GRITS STORED IN BREWERIES FOR USE IN THE MANUFACTURE OF BEER

STORED IN BINS, TANKS, SILOS, GRANARIES, FLAT STORAGE, ETC.:
The application procedure for pellets or tablets in vertical bins is to add them in a uniform and continuous manner to the commodity stream as a bin is filled. The fumigation of flat storage with pellets or tablets involves their distribution throughout the commodity mass using probes designed for such use or uniformly scattering them on the commodity surface.

STORED OR SHIPPED (IN-TRANSIT) IN RAILCARS:
After the car is loaded, scatter the required number of tablets or pellets uniformly onto the surface. As distribution is made, force them under the surface by either stepping on them or pushing them under by hand. In hopper cars it may be necessary to push the commodity away from the fill opening(s) in order to expose the surface. If railcars can be continuously loaded the tablets or pellets can be uniformly added to the commodity stream during the loading process.

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POST FUMIGATION PROCEDURES:
It will be important to always meet the minimum exposure requirements and to exceed them whenever possible. It is virtually impossible to achieve a "100% kill" of insects under field conditions. This is particularly true for the egg, larva and pupa. It is to the advantage of the user to leave the commodity under gas for as long as possible in order to increase the effectiveness of the fumigation.

Once minimum exposure requirements have been met or exceeded, however, the commodity can be aerated, transferred or left alone at the option of the user. As a precautionary measure, however, all working areas should be tested for phosphine before work begins and periodically thereafter using appropriate testing devices. If detected it is recommended that workers wear appropriate respiratory protection equipment until the area is gas free or within allowed limits.

APPLICATION PROCEDURES FOR SPACE FUMIGATIONS

INTRODUCTION
This section describes the recommended method for using DETIA® Pellets and/or DETIA® Tablets for space fumigations in buildings, warehouses, mills, food processing plants, and other static enclosures which can be sealed.

DOSAGE GUIDE
(EXCLUDING STORED TOBACCO - SEE TOBACCO)

Pellets ..... 100-330 per 1000 cubic feet
Tablets ..... 20-66 per 1000 cubic feet

EXPOSURE GUIDE
(EXCLUDING STORED TOBACCO - SEE TOBACCO)

The establishment of the proper exposure period is a critical determination. For all practical purposes the temperature inside the storage structure is the deciding factor. Not to be over-looked, however, is the importance of the humidity. Both temperature and humidity influence the rate of reaction. The higher each is the faster the release of hydrogen phosphide. From a practical standpoint, however, the temperature determines the exposure period.

In that connection the tables on page 6 can be used as guides for determining exposure periods.

TOBACCO

TOBACCO DOSAGE/EXPOSURE GUIDE
Tobacco Temperature Above 60°F

Temperature	Dosage		Minimum Exposure
	Pellets/ 1000 cu. ft.	Tablets/ 1000 cu. ft.	
Above 68°F	100	20	4 days
60° - 68°	100	20	6 days

Post Fumigation Aeration ..... Hogsheads ..... 3 days minimum
Bales ..... 2 days minimum

Tobacco Temperature: 40° - 59°F

Best results are achieved when tobacco is fumigated at temperatures above 60°F. However, where it is not possible to achieve these temperatures, fumigation at temperatures in the 40° - 59°F. range have provided satisfactory control of the cigarette beetle larvae. Eggs and pupae of the cigarette beetle may survive a fumigation at these lower temperatures. The appropriate exposure periods fo fumigation of tobacco are:

50°F - 59°F ..... 7 days
40°F - 49°F ..... 14 days

NOTE: Warehouses and containers must be tightly sealed. Post fumigation aeration time is a minimum of 4 days.

APPLICATION PROCEDURES ..... Buildings, warehouses, mills, food processing plants and other sealable enclosures.

Seal all openings except for the door being used to enter and leave. Pay particular attention to openings to connecting or adjacent structures.

Position nearly square pre-cut-sheets of paper (12 square feet of area or less) onto the floor.

If pellets are used, pour from the original flasks onto the paper sheets, in a single layer, at a density no greater than 50 pellets per square foot.

If tablets are used, pour from the original flask onto the paper sheets, in a single layer, at a density no greater than 25 tablets per square foot.

When fumigating multiple story buildings, each floor is considered a separate enclosure. Application should begin with the top floor and end with the ground floor.

POST FUMIGATION PROCEDURES

1. Open as many doors, vents, windows, etc. as possible without entering the storage structure.

2. Enter after approximately two hours and systematically open any additional doors, louvers, vents, or windows to permit good ventilation. Operators should work in pairs and wear specified gas masks.

3. Permit building to ventilate for several hours.

4. Test for the presence of phosphine gas using appropriate gas detection equipment. Operators should work in pairs, wearing specified gas masks.

5. Dispose of reacted tablets and/or pellets.
   (a) Dry Method: Fold-up sheets of paper in such a way to form a "package". Avoid spillage of the dust. Place the paper/dust packages into dry containers such as metal or fiber drums to facilitate transport of the dust to an appropriate burial site.

   (b) Wet Method: An alternate to the Dry Method is to slurry the dust with water. The recommended procedure is to fill a receptacle about 2/3 full with water and about 2% by volume of any ordinary liquid detergent. Mix the detergent and water together without creating suds. Large quantities of dust may require a 55 gallon drum. The objective is to mix the dust with the water which will require agitation as the dust is slowly added.

   In either case avoid contact with and/or breathing of the dust. Consult the label for other precautions.

INSTRUCTIONS FOR INTRANSIT FUMIGATION OF SHIPHOLDS WITH

Detia®

PELLETS AND TABLETS

RESTRICTED USE PESTICIDE

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.

ACCEPTED

JUN 9 1983

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 2548-43

EPA Establishment No. 33942WG01

EPA Registration No. 2548-43

EPA Registration No. 2545-82

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NOTICE

1. 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.

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

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

3. 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 using gas or vapor detection equipment tests spaces adjacent to spaces containing fumigated cargo and all regularly occupied spaces for fumigation 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.

4. 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.

* "Personal protection equipment means a gas mask filled with a canister designed for phosphine gas which is approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health."

INTRODUCTION

Detia® Tablets and Detia® Pellets are fumigant preparations containing 57% aluminum phosphide (by weight) which when removed from their original shipping containers will liberate Hydrogen Phosphide (phosphine). The reaction between atmospheric moisture and the aluminum phosphide will continue for several days depending on climatic conditions. To be effective the cargo holds or tanks should remain sealed for the duration of the voyage.

IMPORTANT

1. Shipboard fumigation is regulated by the U.S. Coast Guard Regulations 46 CFR 147A.

2. Detia® Tablets (EPA Reg. No. 2548-62) and Detia® Pellets (EPA Reg. No. 2548-63) are classified by the U.S. Environmental Protection Agency as RESTRICTED USE PESTICIDES, 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.

3. For additional information refer to product labels and the booklet entitled "APPLICATION PROCEDURES FOR DETIA® PELLETS AND DETIA® TABLETS".

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.

PREFUMIGATION PROCEDURE

1. Refer to and comply with the regulations and procedures found in U.S. Coast Guard Regulations, 46 CFR 147A.

2. Determine fumigation suitability of the ship and be certain that the cargo holds or tanks to be fumigated are of such construction to permit an in-transit fumigation without danger to the crew during the application and subsequent voyage.

3. Excluding the work openings, seal all other 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" signs on same.

4. On tankers the overspace pressure relief system of each tank must be sealed by (1) the closing of appropriate valves and (2) sealing the openings into the overspace with gas tight materials.

5 Contact appropriate authorities.

DOSAGE CALCULATION AND SCHEDULE

Calculate dosage on the basis of cargo hold volume. Dosage is always calculated for total hold volume irrespective of the amount or quantity of commodity loaded into the hold.

Pellets	100-330 per 1000 cubic feet
Tablets	20-66 per 1000 cubic feet

APPLICATION PROCEDURE BULK DRY CARGO VESSELS AND TANKERS

1. Apply either the tablets or pellets by scattering them uniformly onto the commodity surface utilizing as much of the total surface area as possible. Or, insert them uniformly into the commodity mass, by hand or with probes, to any depth desired.

2. Close and secure hatch covers, tank tops, butterworths, etc. immediately following application.

POST FUMIGATION PROCEDURES

1. Until the ship sails it will be necessary to regularly monitor all areas and spaces of the ship for the presence of hydrogen phosphide (phosphine) using appropriate phosphine detection equipment. Special attention should be given to living quarters, kitchens, storerooms, mess ha , keel ducts, day rooms, the bridge, engine room and any other enclosed spaces occupied or frequented by crew members during a voyage.

2. Review with the Master, or his representative, the following voyage precautions and procedures:

A. DO NOT ENTER FUMIGATED HOLDS OR TANKS.

B. AT REGULAR INTERVALS MONITOR ALL SPACES AND AREAS CONSIDERED TO BE SAFE FOR OCCUPANCY USING APPROPRIATE GAS DETECTION EQUIPMENT.

C. IF PHOSPHINE IS DETECTED, EVACUATE THE SPACE OR AREA, LOCATE AND SEAL OFF THE SOURCE OF THE LEAK WEARING APPROPRIATE RESPIRATORY PROTECTION EQUIPMENT.

D. DO NOT OPEN, VENTILATE OR AERATE THE FUMIGATED HOLDS DURING THE VOYAGE.

E. UPON ARRIVAL INTO THE PORT OF DISCHARGE HOLDS OR TANKS MAY BE OPENED.

IF IT IS NECESSARY FOR WORKERS TO ENTER HOLDS, THE AIR SPACE DIRECTLY ABOVE THE COMMODITY MASS SHOULD BE TESTED FOR PHOSPHINE. IF FOUND IN EXCESS OF ALLOWED LIMITS, IT WILL BE NECESSARY TO ALLOW FOR ADDITIONAL AERATION AND/OR VENTILATION UNTIL IT IS SAFE FOR WORKERS TO ENTER.

PERSONAL PROTECTIVE EQUIPMENT

Because the release of phosphine from Detia® Pellets and Detia® Tablets is delayed after exposure to air, it is usually not necessary for operators to wear gas masks.

However, suitable respiratory protective equipment should be immediately available. Gloves should be worn when handling Detia® Pellets and Tablets.

GAS DETECTION EQUIPMENT

All users of fumigants should have, as standard equipment, gas detection devices designed specifically for phosphine. There are several devices readily available. Consult local suppliers of such equipment or contact Research Products Company for more information.

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