MAR 13 1987

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Pestcon Systems, Inc.
2221 Poplar Boulevard
P.O. Box 469
Alhambra, CA 91802

SUBJECT: Aluminum and Magnesium Phosphide Registration Standard
Your letter of March 2, 1987
EPA Reg. Nos. 5857-1
5857-2

Madam:

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

Enclosed for each product is stamped, approved labeling. Incorporate any comments noted on the labeling and submit five copies of finished printed labeling for our records.

Sincerely,

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

Enclosures

Center Panel

1/c
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RESTRICTED USE PESTICIDE
DUE TO ACUTE INHALATION TOXICITY OF HIGHLY TOXIC PHOSPHINE GAS

For retail sale to and use only by Certified Applicators for those uses covered by the applicators certification or persons trained in accordance with the attached 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. Refer to Pestcon Systems, Inc. Applicator's Manual for complete instructions for the safe use of this product.

FUMITOXIN PELLETS

FOR USE AGAINST LISTED INSECTS WHICH INVEST STORED COMMODITIES, SPECIFIED PROCESSED FOODS, AND ANIMAL FEEDS.

ACCEPTED
with COMMENTS
in EPA Letter Dated:

MAR 1 6 1987

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 5857-2

ACTIVE INGREDIENT:

ALUMINUM PHOSPHIDE.....	55%
INERT INGREDIENTS.....	45%
	100%

KEEP OUT OF REACH OF CHILDREN
DANGER/PELIGRO-POISON

PRECAUCION AL USARIO: Si usted no lee ingles, no use este producto hasta que la etiqueta se le haya sido explicado ampliamente.

Statement of Practical Treatment:
Symptoms of overexposure are headache, dizziness, nausea, difficult breathing, vomiting, and diarrhea. In all cases of overexposure get medical attention immediately. Take victim to a doctor or emergency treatment facility.

If excessive amounts of gas from aluminum phosphide are inhaled:
Get exposed person to fresh air. Keep warm and make sure person can breath freely. If breathing has stopped, give artificial respiration. Do not give anything by mouth to an unconscious person.

If aluminum phosphide tablets, or powder are swallowed:
Drink or administer one or two glasses of water and induce vomiting by touching back of throat with finger, or if available administer syrup of ipecac. Do not give anything by mouth if victim is unconscious or not alert.

If powder or granules of aluminum phosphide get on skin or clothing:
Brush or shake material off clothes in a well ventilated area. Check that all pockets and cuffs are empty. Allow clothes to aerate in a ventilated area prior to laundering. Do not leave contaminated clothing in occupied and/or confined areas such as automobiles, vans, motel rooms, etc. Wash contaminated skin thoroughly with soap and water.

If dust from tablets gets in eyes:
Flush with plenty of water. Get medical attention.

See side panel for additional precautionary statements.

Manufactured for:

PESTCON SYSTEMS, INC.
BOX 469, ALHAMBRA, CALIFORNIA 91802 TELEPHONE (213) 283-2761
Contents: Approx. 1,660 pellets EPA REG. NO. 5857-2
Net Weight: 1,000 g (2 lb 3.28 ozs) EPA EST. NO. 46060-CI-04

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

DANGER: FUMITOXIN pellets or dust can be fatal if swallowed. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke while handling aluminum phosphide fumigants. When a sealed container is opened, allowing material to come in contact with moisture, water or acids, toxic phosphine gas will be released. If a garlic odor is detected, refer to section on ~~respiratory protection or applicator/worker exposure~~ Industrial Hygiene Monitoring on page ___ of the Product Manual for appropriate monitoring procedures. Pure phosphine gas is odorless; the odor is due to a contaminant. Since an odor may not be detected under certain circumstances, the absence of garlic odor does not mean that phosphine gas is absent. Observe proper application, aeration, re-entry and disposal procedures specified elsewhere in the labeling to prevent overexposure.

Physical and Chemical Hazards

Aluminum phosphide pellets and partially spent dust will release hydrogen phosphide if exposed to moisture from the air or if it comes into contact with water, acids and many other liquids. Piling of pellets or dust from their fragmentation may cause a temperature increase and confine the release of gas so that ignition could occur.

It is recommended that you open aluminum phosphide products in open air or near a fan which exhausts outside immediately. Never open in flammable atmosphere because on rare occasions it may flash. When opening, point the container away from the face and body. These precautions will also reduce the applicators exposure to hydrogen phosphide (phosphine) gas.

Pure hydrogen phosphide (phosphine) gas is practically insoluble in water, fats and oils, and is stable at normal fumigation temperatures. However, it may react with certain metals and cause corrosion, especially at higher temperatures and relative humidities.

Metals such as copper, brass, and other copper alloys, and precious metals such as gold and silver are susceptible to corrosion by phosphine, especially at high temperatures and humidity. Thus items such as small electric motors, smoke detectors, brass sprinkler heads, batteries and battery chargers, forklifts, temperature monitoring systems, electrical switch gear, communication devices, computers, calculators, watches, and other electronic equipment should be protected or removed before fumigation. Hydrogen phosphide will also react with certain metallic salts and, therefore, sensitive items such as photographic film, copying papers and some inorganic pigments, etc. should not be exposed.

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Note to Physician: Aluminum phosphide in pellets react with moisture from the air, water, acids and many other liquids to release hydrogen phosphide (phosphine) gas. Mild exposure by inhalation causes malaise (indefinite feeling of sickness), ringing of ears, fatigue, nausea, and pressure in the chest which is relieved by removal to fresh air. Moderate poisoning causes weakness, vomiting, pain just above the stomach, chest pain, diarrhea and dyspnea (difficulty in breathing). Symptoms of severe poisoning may occur within a few hours to several days, resulting in pulmonary edema (fluid in lungs) and may lead to dizziness, cyanosis (blue or purple skin color), unconsciousness, and death.

In sufficient quantity, phosphine effects the liver, kidneys, lungs, nervous system and circulatory system. Inhalation can cause lung edema (fluid in lungs) and hyperemia (excess of blood in body part), small perivascular brain hemorrhage and brain edema (fluid in brain). Ingestion can cause lung and brain symptoms but damage to the viscera (body cavity organs) is more common. Phosphine poisoning may result in (1) pulmonary edema, (2) liver elevated serum GOT, LDH and alkaline phosphatase, reduced prothrombin, hemorrhage and jaundice (yellow skin color) and (3) kidney hematuria (blood in urine) and anauria (abnormal or lack of urination). Pathology is characteristic of hypoxia (oxygen deficiency in blood tissue). Frequent exposure to subacute concentrations over a period of days or weeks may cause poisoning. Treatment is symptomatic.

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. See booklet for FUMITOXIN aluminum phosphide for additional use directions available from Pestcon Systems, Inc. at 2221 Poplar Blvd., P.O. Box 469, Alhambra, California 91802, U.S.A. (213) 283-2761.

Placarding Instructions: Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER/PELIGRO and the "SKULL AND CROSSBONES" and the words "AREA AND/OR COMMODITY UNDER FUMIGATION, DO NOT ENTER/NO ENTRE", the date of the fumigation, name of fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not move trucks, vans or trailers over public roads during fumigation.

Delete

Label must refer to Storage and Disposal and Spill and Leak Procedures in Product Manual. Add some general instructions if there is room on this label.

General Information: FUMITOXIN is a fumigant which when applied according to label instructions is activated by atmospheric humidity. FUMITOXIN has been found effective against many stored products insects and their pre-adult stages -- that is eggs, larvae, and pupae: Refer to the supplemental label manual for specific species.

The following raw agricultural commodities, animal feeds and feed ingredients, processed foods and non-food products may be fumigated with FUMITOXIN fumigant:

RAW AGRICULTURAL COMMODITIES AND ANIMAL FEED AND FEED INGREDIENTS WHICH MAY BE FUMIGATED WITH FUMITOXIN

almonds
animal feed & feed ingredients
barley
Brazil nuts
cashews
cocoa beans
coffee beans
corn
cottonseed
dates
filberts
flower seed
grass seed
millet
oats
peanuts
pecans
pistachio nuts
popcorn
rice
rye
safflower seed
sesame seed
seed & pod vegetables
sorghum
soy beans
sunflower seeds
triticale
vegetable seed
walnuts
wheat
~~wild rice~~ delete

PROCESSED FOODS WHICH MAY BE FUMIGATED WITH FUMITOXIN

The listed processed foods may be fumigated with FUMITOXIN. Under no condition shall any processed food or bagged commodity come in contact with FUMITOXIN pellets, or their residual dust except that FUMITOXIN may be added directly to processed brewer's rice, malt and corn grits for use in the manufacture of beer.

Processed Candy and Sugar
Cereal Flours and Bakery Mixes
Cereal Foods (including cookies, crackers, macaroni, noodles, pasta, pretzels, snack foods and spaghetti)
Processed Cereals (including milled fractions and packaged cereals)
Cheese and Cheese By-products
Chocolate and Chocolate Products (assorted chocolate, chocolate liquor, cocoa, cocoa powder, dark chocolate coating and milk chocolate)
Processed Coffee
Corn Grits
Cured, Dried and Processed Meat Products and Dried Fish
Dates
Dried Eggs and Egg Yolk Solids
Dried Milk, Dried Powdered Milk, Non-dairy Creamers, and Nonfat Dried Milk
Dried or Dehydrated Fruits (apples, dates, figs, peaches, pears, prunes, raisins and Sultanas)
Figs
Malt
Processed Herbs, Spices, Seasonings and Condiments
Processed Nuts (almonds, apricot kernels, Brazil nuts, cashews, filberts, pecans, pistachio nuts and walnuts)
Processed Oats (including oatmeal)
Peanuts
Rice (brewers rice grits, enriched and polished)
Soybean Flour and Milled Fractions
Processed Tea
Dried and Dehydrated Vegetables (beans, carrots, lentils, peas, potato flour, potato products and spinach)
~~Wildrice~~ Wild rice
Yeast (including primary yeast)

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NON-FOOD COMMODITIES WHICH MAY BE FUMIGATED WITH FUMITOXIN

Processed or Unprocessed Cotton, Wool and Other Natural Fibers, Cloth or Clothing
Feathers
Human Hair, Rubberized Hair, Vulcanized Hair, Mohair, Animal Hide, Furs
Tobacco
Wood, Cut Trees, Wood Chips and Wood and Bamboo Products
Paper and Paper Products
Dried Plants and Flowers, Hay or Straw
Seeds (grass seed, ornamental herbaceous plant seed and vegetable seed)

REFER TO SUPPLEMENTAL LABEL MANUAL FOR PROPER DOSAGE RATES, EXPOSURE TIMES & PROCEDURES

NOTE: FUMIGATION OF ANY COMMODITIES NOT LISTED ON THIS LABEL OR OTHER APPROVED LABELING IS SPECIFICALLY PROHIBITED

The following table may be used as a guide in determining the minimum length of the exposure period at the indicated temperatures.

TEMPERATURE TO WHICH FUMIGANT AND INSECTS ARE EXPOSED	MINIMUM EXPOSURE PERIOD FOR FUMITOXIN PELLETS
Below 40° F (5° C)	Do Not Fumigate
40° - 53° F (4-12°C)	8 days (192 hours)
54° - 59° F (12-15°C)	4 days (96 hours)
60° - 68° F (16-20°C)	3 days (72 hours)
Above 68° F (20°C)	2 days (48 hours)

Dosage is calculated per 1,000 cubic feet or per 1,000 bushels

PRODUCT	PER 1,000 CU. FT.	PER 1,000 BUSHELS
PELLETS	100 - 500	125 - 625

Fumigation of Barges*: Refer to supplemental label manual for directions.

In-Transit Ship Fumigation*: Refer to supplemental labelling entitled "In-transit fumigation of grain on ships."

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

Rodent Burrow Fumigation: Refer to supplemental label and manual for directions.

This product is accompanied by an approved applicator's manual. Read and understand the entire labeling. All parts of the label are equally important for safe and effective use of this product. Call Pestcon Systems, Inc., or EPA if you have any questions or do not understand any part of this labeling.

WARRANTY: Seller warrants that the product conforms to its commercial description and when used according to label directions under normal conditions of use, it is reasonably fit for the purposes stated on the label. Seller makes no other warranty, either express or implied, and Buyer assumes all risk should the product be used contrary to label instructions.

Classified by UL Inc. as to fire hazard only when used specifically as directed in the instructions on this container, and supplemental labeling. FUMITOXIN is 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. CONTROL NO. 994P

Center Panel

RESTRICTED USE PESTICIDE
DUE TO ACUTE INHALATION TOXICITY OF HIGHLY TOXIC PHOSPHINE GAS

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FOR USE AGAINST LISTED INSECTS WHICH INVEST STORED COMMODITIES, SPECIFIED PROCESSED FOODS, AND ANIMAL FEEDS.

ACCEPTED
with COMMENTS
In EPA Letter Dated:

MAR 1 6 1987

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 5857-2

ACTIVE INGREDIENT:

ALUMINUM PHOSPHIDE.....	55%
INERT INGREDIENTS.....	45%
	100%

KEEP OUT OF REACH OF CHILDREN
DANGER/PELIGRO-POISON

PRECAUCION AL USARIO: Si usted no lee ingles, no use este producto hasta que la etiqueta se le haya sido explicado ampliamente.

Statement of Practical Treatment:
Symptoms of overexposure are headache, dizziness, nausea, difficult breathing, vomiting, and diarrhea. In all cases of overexposure get medical attention immediately. Take victim to a doctor or emergency treatment facility.

If excessive amounts of gas from aluminum phosphide are inhaled:
Get exposed person to fresh air. Keep warm and make sure person can breath freely. If breathing has stopped, give artificial respiration. Do not give anything by mouth to an unconscious person.

If aluminum phosphide tablets, or powder are swallowed:
Drink or administer one or two glasses of water and induce vomiting by touching back of throat with finger, or if available administer syrup of ipecac. Do not give anything by mouth if victim is unconscious or not alert.

If powder or granules of aluminum phosphide get on skin or clothing:
Brush or shake material off clothes in a well ventilated area. Check that all pockets and cuffs are empty. Allow clothes to aerate in a ventilated area prior to laundering. Do not leave contaminated clothing in occupied and/or confined areas such as automobiles, vans, motel rooms, etc. Wash contaminated skin thoroughly with soap and water.

If dust from tablets gets in eyes:
Flush with plenty of water. Get medical attention.

See side panel for additional precautionary statements.

Manufactured for:

PESTCON SYSTEMS, INC.
BOX 469, ALHAMBRA, CALIFORNIA 91802 TELEPHONE (213) 283-2761
Contents: Approx. 2,490 pellets EPA REG. NO. 5857-2
Net Weight: 1.5 Kg EPA EST. NO. 46060-CI-04

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

DANGER: FUMITOXIN pellets or dust can be fatal if swallowed. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke while handling aluminum phosphide fumigants. When a sealed container is opened, allowing material to come in contact with moisture, water or acids, toxic phosphine gas will be released. If a garlic odor is detected, refer to section on respiratory protection of applicator/worker exposure of the product manual for appropriate monitoring procedures. Pure phosphine gas is odorless; the odor is due to a contaminant. Since an odor may not be detected under certain circumstances, the absence of garlic odor does not mean that phosphine gas is absent. Observe proper application, aeration, re-entry and disposal procedures specified elsewhere in the labeling to prevent overexposure.

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Aluminum phosphide pellets and partially spent dust will release hydrogen phosphide if exposed to moisture from the air or if it comes into contact with water, acids and many other liquids. Piling of pellets or dust from their fragmentation may cause a temperature increase and confine the release of gas so that ignition could occur.

It is recommended that you open aluminum phosphide products in open air or near a fan which exhausts immediately. Never open in flammable atmosphere because on rare occasions it may flash. When opening, point the container away from the face and body. These precautions will also reduce the applicators exposure to hydrogen phosphide (phosphine) gas.

Pure hydrogen phosphide (phosphine) gas is practically insoluble in water, fats and oils, and is stable at normal fumigation temperatures. However, it may react with certain metals and cause corrosion, especially at higher temperatures and relative humidities.

Metals such as copper, brass, and other copper alloys, and precious metals such as gold and silver are susceptible to corrosion by phosphine, especially at high temperatures and humidity. Thus items such as small electric motors, smoke detectors, brass sprinkler heads, batteries and battery chargers, forklifts, temperature monitoring systems, electrical switch gear, communication devices, computers, calculators, watches, and other electronic equipment should be protected or removed before fumigation. Hydrogen phosphide will also react with certain metallic salts and, therefore, sensitive items such as photographic film, copying papers and some inorganic pigments, etc. should not be exposed.

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Note to Physician: Aluminum phosphide in pellets react with moisture from the air, water, acids and many other liquids to release hydrogen phosphide (phosphine) gas. Mild exposure by inhalation causes malaise (indefinite feeling of sickness), ringing of ears, fatigue, nausea, and pressure in the chest which is relieved by removal to fresh air. Moderate poisoning causes weakness, vomiting, pain just above the stomach, chest pain, diarrhea and dyspnea (difficulty in breathing). Symptoms of severe poisoning may occur within a few hours to several days, resulting in pulmonary edema (fluid in lungs) and may lead to dizziness, cyanosis (blue or purple skin color), unconsciousness, and death.

In sufficient quantity, phosphine effects the liver, kidneys, lungs, nervous system and circulatory system. Inhalation can cause lung edema (fluid in lungs) and hyperemia (excess of blood in body part), small perivascular brain hemorrhage and brain edema (fluid in brain). Ingestion can cause lung and brain symptoms but damage to the viscera (body cavity organs) is more common. Phosphine poisoning may result in (1) pulmonary edema, (2) liver elevated serum GOT, LDH and alkaline phosphatase, reduced prothrombin, hemorrhage and jaundice (yellow skin color) and (3) kidney hematuria (blood in urine) and anauria (abnormal or lack of urination). Pathology is characteristic of hypoxia (oxygen deficiency in blood tissue). Frequent exposure to subacute concentrations over a period of days or weeks may cause poisoning. Treatment is symptomatic.

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. See booklet for FUMITOXIN aluminum phosphide for additional use directions available from Pestcon Systems, Inc. at 2221 Poplar Blvd., P.O. Box 469, Alhambra, California 91802, U.S.A. (213) 283-2761.

Placarding Instructions: ~~Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER/PELIGRO and the "SKULL AND CROSSBONES" and the words "AREA AND/OR COMMODITY UNDER FUMIGATION, DO NOT ENTER/NO ENTRE", the date of the fumigation, name of fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not move trucks, vans or trailers over public roads during fumigation.~~ Delete

Label must refer to Storage & Disposal and Spill and Leak Procedures in product manual. Add some general instructions if there is room on this label.

General Information: FUMITOXIN is a fumigant which when applied according to label instructions is activated by atmospheric humidity. FUMITOXIN has been found effective against many stored products insects and their pre-adult stages -- that is eggs, larvae, and pupae: Refer to the supplemental label manual for specific species.

The following raw agricultural commodities, animal feeds and feed ingredients, processed foods and non-food products may be fumigated with FUMITOXIN fumigant:

RAW AGRICULTURAL COMMODITIES AND ANIMAL FEED AND FEED INGREDIENTS WHICH MAY BE FUMIGATED WITH FUMITOXIN

almonds
animal feed & feed ingredients
barley
Brazil nuts
cashews
cocoa beans
coffee beans
corn
cottonseed
dates
filberts
flower seed
grass seed
millet
oats
peanuts
pecans
pistachio nuts
popcorn
rice
rye
safflower seed
sesame seed
seed & pod vegetables
sorghum
soy beans
sunflower seeds
triticale
vegetable seed
walnuts
wheat
~~wild rice~~ delete

PROCESSED FOODS WHICH MAY BE FUMIGATED WITH FUMITOXIN

The listed processed foods may be fumigated with FUMITOXIN. Under no condition shall any processed food or bagged commodity come in contact with FUMITOXIN pellets, or their residual dust except that FUMITOXIN may be added directly to processed brewer's rice, malt and corn grits for use in the manufacture of beer.

Processed Candy and Sugar
Cereal Flours and Bakery Mixes
Cereal Foods (including cookies, crackers, macaroni, noodles, pasta, pretzels, snack foods and spaghetti)
Processed Cereals (including milled fractions and packaged cereals)
Cheese and Cheese By-products
Chocolate and Chocolate Products (assorted chocolate, chocolate liquor, cocoa, cocoa powder, dark chocolate coating and milk chocolate)
Processed Coffee
Corn Grits
Cured, Dried and Processed Meat Products and Dried Fish
Dates
Dried Eggs and Egg Yolk Solids
Dried Milk, Dried Powdered Milk, Non-dairy Creamers, and Nonfat Dried Milk
Dried or Dehydrated Fruits (apples, dates, figs, peaches, pears, prunes, raisins and Sultanas)
Figs
Malt
Processed Herbs, Spices, Seasonings and Condiments
Processed Nuts (almonds, apricot kernels, Brazil nuts, cashews, filberts, pecans, pistachio nuts and walnuts)
Processed Oats (including oatmeal)
Peanuts
Rice (brewers rice grits, enriched and polished)
Soybean Flour and Milled Fractions
Processed Tea
Dried and Dehydrated Vegetables (beans, carrots, lentils, peas, potato flour, potato products and spinach)
~~Wild rice~~ Wild rice
Yeast (including primary yeast)

NON-FOOD COMMODITIES WHICH MAY BE FUMIGATED W. FUMITOXIN

Processed or Unprocessed Cotton, Wool and Other Natural Fibers, Cloth or Clothing
Feathers
Human Hair, Rubberized Hair, Vulcanized Hair, Mohair, Animal Hide, Furs
Tobacco
Wood, Cut Trees, Wood Chips and Wood and Bamboo Products
Paper and Paper Products
Dried Plants and Flowers, Hay or Straw
Seeds (grass seed, ornamental herbaceous plant seed and vegetable seed)

REFER TO SUPPLEMENTAL LABEL MANUAL FOR PROPER DOSAGE RATES, EXPOSURE TIMES & PROCEDURES

NOTE: FUMIGATION OF ANY COMMODITIES NOT LISTED ON THIS LABEL OR OTHER APPROVED LABELING IS SPECIFICALLY PROHIBITED

The following table may be used as a guide in determining the minimum length of the exposure period at the indicated temperatures.

TEMPERATURE TO WHICH FUMIGANT AND INSECTS ARE EXPOSED	MINIMUM EXPOSURE PERIOD FOR FUMITOXIN PELLETS
Below 40° F (5 ° C)	Do Not Fumigate
40° - 53° F (4-12°C)	8 days (192 hours)
54° - 59° F (12-15°C)	4 days (96 hours)
60° - 68° F (16-20°C)	3 days (72 hours)
Above 68° F (20°C)	2 days (48 hours)

Dosage is calculated per 1,000 cubic feet or per 1,000 bushels

PRODUCT	PER 1,000 CU. FT.	PER 1,000 BUSHELS
PELLETS	100 - 500	125 - 625

Fumigation of Barges*: Refer to supplemental label manual for directions.

In-Transit Ship Fumigation*: Refer to supplemental labelling entitled "In-transit fumigation of grain on ships."

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

Rodent Burrow Fumigation: Refer to supplemental label and manual for directions.

This product is accompanied by an approved applicator's manual. Read and understand the entire labeling. All parts of the label are equally important for safe and effective use of this product. Call Pestcon Systems, Inc., or EPA if you have any questions or do not understand any part of this labeling.

WARRANTY: Seller warrants that the product conforms to its commercial description and when used according to label directions under normal conditions of use, it is reasonably fit for the purposes stated on the label. Seller makes no other warranty, either express or implied, and Buyer assumes all risk should the product be used contrary to label instructions.

Classified by UL Inc as to fire hazard only when used specifically as directed in the instructions on this container, and supplemental labeling. FUMITOXIN is 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. CONTROL NO. 994P

RESTRICTED USE PESTICIDE
DUE TO ACUTE INHALATION TOXICITY OF HIGHLY TOXIC PHOSPHINE GAS

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ACCEPTED
with COMMENTS
in EPA Letter Dated:

MAR 1 6 1987

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 5857-2

FUMITOXIN
ALUMINUM PHOSPHIDE TABLETS AND PELLETS

GENERAL PROCEDURES FOR FUMIGATION OF MILLS AND WAREHOUSES WITH FUMITOXIN ALUMINUM PHOSPHIDE TABLETS AND PELLETS

1. Read the complete label on the container as well as all supplemental labeling before use.

2. Using the label, determine the dosage of tablets or pellets to be applied based upon the following parameters for space fumigation:

   a) the volume of the structure
   b) the air and/or commodity temperature
   c) the general tightness of the structure to be fumigated

3. Carefully seal the area to be fumigated.

4. Place trays or sheets of Kraft paper, up to 12 sq. ft. (1.1 sq. M) in area, on the floor of the structure to hold the tablets or pellets.

5. Spread tablets or pellets on the sheets at a density no greater than 30 tablets per sq. ft. or 75 pellets per sq. ft. This corresponds to slightly more than one-half flask of tablets or one-half flask of pellets per 3' x 4' sheet.

6. Check the sheet to see that aluminum phosphide has not been piled up and that it is dispersed evenly to minimize contact between the individual tablets or pellets.

7. Doors leading to the fumigated space are then closed, sealed and locked. Aluminum phosphide warning signs must be placed on all entrances. Refer to the label and training booklet for required wording for signs.

8. The fumigation period usually lasts from 2 to 5 days, depending upon the temperature. Do not fumigate when commodity temperature is below 40°F (5°C). Consult the label and other labeling for further information.

9. Upon completion of the exposure period, windows and doors should be opened and the fumigated structure allowed to aerate. Gas concentration readings ~~should~~ must be taken using low level detector tubes before allowing personnel to re-enter the area.

However, partially spent "green" dust must

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10. Spent residue dust remaining after the fumigation may be disposed of by burial at approved sites, ~~or it may~~ first be deactivated using water-detergent mixtures as follows:

    a) Deactivation solution is prepared by adding the appropriate amount of low sudsing liquid detergent or surfactant agent to water in a drum or other suitable container.

    b) Dust from the individual 3' x 4' sheets is poured slowly into the deactivating solution and stirred so as to thoroughly wet all of the spent dust. This must be done in the outdoor air and not in the fumigated structure. Dust from tablets or pellets should be mixed into no less than 10 gallons of water-detergent solution for each case of spent material. CAUTION: Do not allow quantities of dry, spent dust to be collected or stored without deactiviation. Respiratory protection must be worn during wet deactivation.

    c) Dispose of the deactivated dust-water solution. The solids will not contaminate the environment. Do not dispose of dust in toilet.

11. Triple rinsed containers may be offered for recycling, reconditioning, or disposal in an approved landfill or buried in a safe place.

12. Some local and state waste disposal regulations may vary from the above recommendations. Disposal procedures should be reviewed with the appropriate authorities to ensure compliance with local regulations.

13. Remove warning placards from the completely aerated structure only when instructed to do so by a Certified Applicator.

NOTES:

1. A certified applicator must be in charge of fumigation. Some states require a licensed operator.

2. Approved respiratory protection must be available when applying fumigant from within an enclosed area.

3. Legal regulations may require prior notification of area police and/or fire departments.

4. Hydrogen phosphide from aluminum phosphide is corrosive to copper and precious metals. Electrical outlets and other copper-containing items should be covered for protection. Items such as fork lifts, copy machines, office machines and other sensitive equipment should be removed from the structure prior to fumigation.

5. Collection and storage of dry, spent aluminum phosphide dust, especially in closed containers, may result in a fire hazard.

6. Special care should be taken in deactivation of so-called "green" dust which results from incomplete exposure, and thus, incomplete decomposition of aluminum phosphide tablets and pellets. (Not less than 30 gallons of water-detergent solution should be used.)

CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. AS TO FIRE HAZARD ONLY WHEN USED SPECIFICALLY AS DIRECTED IN THE MANUFACTURER'S INSTRUCTIONS. FUMITOXIN NEW COATED TABLETS AND COATED PELLETS ARE NONCOMBUSTIBLE, BUT EXPOSURE TO MOIST AIR OR WATER RELEASES FLAMMABLE AND TOXIC PHOSPHINE (HYDROGEN PHOSPHIDE) GAS. SPONTANEOUS IGNITION MAY RESULT IF CONTACTED BY WATER, ACIDS, OR CHEMICALS.
CONTROL NO. 994P

PESTCON SYSTEMS, INC.

BOX 469, ALHAMBRA, CALIFORNIA 91802 U.S.A.
TELEPHONE (213) 283-2761 TELEX NO. 698635
EPA Registration Nos. 5857-1 and 5857-2
EPA Establishment No. 46060-Ci-04

14166
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RESTRICTED USE PESTICIDE
DUE TO ACUTE INHALATION TOXICITY OF HIGHLY TOXIC PHOSPHINE GAS

For retail sale to and use only by Certified Applicators for those uses covered by the applicators certification or persons trained in accordance with the attached 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. Refer to Pestcon Systems, Inc. Applicator's Manual for complete instructions for the safe use of this product.

Supplemental Label For:

FUMITOXIN

Tablets and Pellets

EPA Reg. No: 5857-1-ZA
5857-2-ZA

DIRECTIONS FOR USE

ACCEPTED
with COMMENTS
In EPA Letter Dated:

MAR 1 6 1987

Under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 5857-2

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

Beehives, supers, and other beekeeping equipment. Africanized honeybee, and bees infested with tracheal mites.

Dosage:

For FUMITOXIN Coated Pellets:

150 - 225 pellets/1000 cu. ft. for 48 hours at 20°C (69°F) or above
150 - 225 pellets/1000 cu. ft. for 72 hours at 16° - 20°C (60° - 68°F)
150 - 225 pellets/1000 cu. ft. for 96 hours at 12° - 15°C (54° - 59°F)

Insert fumigation time for 40°-54° F

For FUMITOXIN New Coated Tablets:

30 - 45 tablets/1000 cu. ft. for 72 hours at 20°C (69°F) or above
30 - 45 tablets/1000 cu. ft. for 96 hours at 16° - 20°C (60° - 68°F)
30 - 45 tablets/1000 cu. ft. for 120 hours at 12° - 15°C (54° - 59°F)

Method of Application: Chamber at NAP, or Tarpaulin. Place pellets or tablets in moisture permeable envelopes. Each envelope should not contain more than 2 tablets or 10 pellets. Evenly distribute the envelopes inside the fumigation enclosure. DO NOT place the envelopes directly on the honeycombs.

All applicable directions, restrictions, and precautions on the EPA-registered label(s) are to be followed.

This labeling must be in the possession of the user
at the time of pesticide application.

Treated honey will be used only as bee feed.

PESTCON SYSTEMS, INC. Box 469, Alhambra, CA 91802 USA (213) 283-2761 Telex 698635

RESTRICTED USE PESTICIDE
DUE TO ACUTE INHALATION TOXICITY OF HIGHLY TOXIC PHOSPHINE GAS

For retail sale to and use only by Certified Applicators for those uses covered by the applicators certification or persons trained in accordance with the attached 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. Refer to Pestcon Systems, Inc. Applicator's Manual foi complete instructions for the safe use of this product.

ACCEPTED
with COMMENTS
In EPA Letter Dated:

MAR 16 1987

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 5857-2

FUMITOXIN

ALUMINUM PHOSPHIDE PELLETS

SUPPLEMENTAL LABELING TO CLARIFY USE DIRECTIONS

DIRECTIONS FOR USE:

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

FUMITOXIN Coated Pellets may be used to control stored product pests infesting processed spices, stored in relatively air tight drums, or other small containers.

Spices stored in this manner may be fumigated by placing the pellets in a moisture permeable envelope in such a manner as to keep the pellets, as well as the residue, from coming into contact with the spices.

Drums are then secured in a designated area and this area must be placarded on all accessible sides with a sign containing at least the signal word DANGER/PELIGRO, the "Skull and Crossbones" symbol in red, and the words, "Area and/or commodity under fumigation, DO NOT ENTER/NO ENTRE until completely aerated (include the date of fumigation and the name and address of the fumigator)".

Following fumigation, envelopes containing the residual dust must be removed from the drums and disposed of in accordance with the FUMITOXIN label. The drum must be allowed to aerate prior to shipment.

Suggested dosage is 1 - 2 pellets per 10 cubic feet (.283 cubic meters) of storage space. Exact dosage is dependent upon tightness of the storage structure, commodity temperature and length of exposure period.

Exposure times required are approximated below:

Commodity at 40°F - 53°F (4 - 12°C)	**8 days**
Commodity at 54°F - 59°F (12 - 15°C)	**4 days**
Commodity at 60°F - 68°F (16 - 20°C)	**3 days**
Commodity over 68°F (20°C)	**2 days minimum**

Do not fumigate if commodity temperature is below 40°F (5°C).

NOTE: Consult the label for additional warnings and precautions to be observed when using this product.

PESTCON SYSTEMS, INC.

BOX 469, ALHAMBRA, CALIFORNIA 91802 USA TELEPHONE (213) 283-2761 TELEX NO. 698635

EPA Registration No. 5857-2
EPA Establishment No. 46060-Ci-04

RESTRICTED USE PESTICIDE

DUE TO ACUTE IN ATION TOXICITY OF HIGHLY TOXIC OSPHINE GAS

For retail sale to and use only by Certified Applicators for those uses covered by the applicators certification or persons trained in accordance with the attached 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. Refer to Pestcon Systems, Inc. Applicator's Manual for complete instructions for the safe use of this product.

Supplemental Label For:
FUMITOXIN ALUMINUM PHOSPHIDE PELLETS
FOR CONTROL OF BURROWING RODENTS AND MOLES

ENVIRONMENTAL HAZARDS

This product is very highly toxic to wildlife. Non-target organisms exposed to phosphine gas in burrows will be killed. Do not apply directly to water or wetlands (swamps, bogs, marshes, and potholes). Do not contaminate water by cleaning of equipment or disposal of wastes.

ENDANGERED SPECIES CONSIDERATIONS

The use of any pesticide in a manner that may kill or otherwise harm an endangered or threatened species or adversely modify their habitat is a violation of federal laws. The use of this product is controlled to prevent death or harm to endangered or threatened species that occur in the following countries or elsewhere in their range:

STATE (REGIONAL OFFICE FWS) Species	COUNTY (UNLESS SPECIFIED)	
ARIZONA (ALBUQUERQUE, N.M.)		
Black-footed ferret	STATEWIDE	
CALIFORNIA (PORTLAND, OR)	KERN	MERCED
San Joaquin Kit-Fox	KINGS	MONTEREY
	TULARE	SAN BENITO
	FRESNO	SAN LUIS OBISPO
	VENTURA	SANTA BARBARA
Blunt-nosed Leopard Lizard	KERN	MADERA
	KINGS	MERCED
	FRESNO	TULARE
COLORADO (DENVER, CO)		
Black-footed ferret	STATEWIDE	
FLORIDA (ATLANTA, GA)		
Eastern Indigo Snake	STATEWIDE	
GEORGIA (ATLANTA, GA)		
Eastern Indigo Snake	STATEWIDE	
KANSAS (DENVER, CO)		
Black-footed ferret	STATEWIDE	
MONTANA (DENVER, CO)		
Black-footed ferret	STATEWIDE	
NEBRASKA (DENVER, CO)		
Black-footed ferret	STATEWIDE	
NEW MEXICO (ALBUQUERQUE, NM)		
Black-footed ferret	STATEWIDE	
NORTH DAKOTA (DENVER, CO)		
Black-footed ferret	STATEWIDE	
OKLAHOMA (ALBUQUERQUE, NM)		
Black-footed ferret	STATEWIDE	
SOUTH DAKOTA (DENVER, CO)		
Black-footed ferret	STATEWIDE	
TEXAS (ALBUQUERQUE, NM)		
Black-footed ferret	STATEWIDE	
UTAH (DENVER, CO)		
Desert Tortoise	WASHINGTON	
Black-footed ferret	STATEWIDE	
WYOMING (DENVER, CO)		
Black-footed ferret	STATEWIDE	

ACCEPTED
with COMMENTS
In EPA Letter Dated:

MAR 16 1987

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 5857-2

SPECIAL LOCAL RESTRICTIONS
ON THE USE OF FUMITOXIN NEW COATED
PELLETS-R FOR CONTROL OF BURROWING PESTS

NORTH CAROLINA

FUMITOXIN pellets may only be used for control of rats, mice and voles in the state of North Carolina. Use against other pests is not permitted.

MISSOURI

"A state permit is required for use of pesticides in Missouri to control small mammals, except rats or mice. Please contact the Missouri Department of Conservation office for information."

KANSAS

"A special permit for black-tailed prairie dog control by poisoning is required in Kansas. Contact the Kansas Fish and Game Commission to obtain this permit."

Use of this product in the above areas is prohibited without first contacting and obtaining permission from the Endangered Species Specialist in the regional offices of the U.S. Fish and Wildlife Services (FWS) nearest you.

DIRECTIONS FOR USE: It is a violation of Federal Law to use this product in a manner inconsistent with its labelling.

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. See training booklet for FUMITOXIN aluminum phosphide for complete use directions available from Pestcon Systems, Inc. at P.O. Box 469, Alhambra, California 91802, U.S.A. (213) 283-2761.

FOR CONTROL OF FOLLOWING BURROWING RODENTS AND MOLES: Marmot ap. - Woodchucks and Yellow-Belly marmots (Rockchuck), Prairie Dogs (except Utah Prairie Dogs), Norway and Roof Rats, House Mice, Ground Squirrels, Moles, Voles, Gophers, and Chipmunks.

DIRECTIONS FOR USE AGAINST BURROWING PESTS: Add from 10 to 20 FUMITOXIN pellets to the burrow. Seal tightly by shoveling soil over the entrance after first packing the opening with crumpled newspaper. This will prevent soil from covering the FUMITOXIN pellets and slowing down their action. Use lower rates in smaller burrows when soil moisture conditions and higher rates in larger burrows when soil moisture is low. Treat re-opened burrows a second time 1 to 2 days after the initial treatment. For use on non-crop areas, crop areas and orchards.

OUTDOOR USE ONLY: Do not use within 15 feet (5 meters) of inhabitated structures. Do not apply to burrow which may open under or into occupied buildings. Please consult Local, State and Federal Game Authorities to ensure that endangered species do not inhabit the area proposed for treatment.

WARRANTY: Seller warrants that the product conforms to its chemical description and when used according to label directions under normal conditions of use, it is reasonably fit for the purposes stated on the label. Seller makes no other warranty either express or implied, and buyer assumes all risk should the product be used contrary to label instruction.

Manufactured for:

PESTCON SYSTEMS, INC.

BOX 469, Alhambra, CA 91802, U.S.A. TELEPHONE (213) 283-2761 TELEX 698635

EPA REG. NO. 5857-2
EPA EST. NO. 46060-C1-04

ACCEPTED
with COMMENTS
In EPA Letter Dated:

MAR 1 6 1987

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 5857-2

LABELING

(IN-TRANSIT FUMIGATION ON SHIPS)

EPA REGISTRATION NO. 5857-1 - FUMITOXIN NEW COATED TABLETS

EPA REGISTRATION NO. 5857-2 - FUMITOXIN COATED PELLETS

NOTE. Shipboard fumigation is regulated by U.S. Coast Guard Regulation 46 CFR 147A.

NOTE. Not all types of ships are suitable to carry cargo under fumigation. The following directions for use are applicable only to cargo vessels and tankers where there are no crew quarters above the cargo holds.

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

   If it is determined that the design and configuration of the vessel does not allow for safe occupancy by the ship's crew throughout the duration of the fumigation, then the vessel 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 fumigated 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 vessel aerated before the manned vessel leaves port, the person in charge of the vessel shall insure that the appropriate protection equipment and detection devices, and a person qualified in their operation be on board the vessel during the voyage.

(1) Refer to FUMITOXIN registered labels and other labeling for precautionary statements and other use information.

* 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 it equivalent must be used.

PROCEDURES TO BE FOLLOWED

A. PREPARATION

1. The fumigation must be under the direct supervision of a professional fumigator trained in shipboard application.

2. The fumigator in charge must determine, either by a personal inspection or through the services of a marine chemist or surveyor, that the vessel can be fumigated without apparent hazard to the crew. It may be necessary to meet with the Engineering Officer and review the mechanical drawings of the vessel regarding specific features (e.g. the presence or absence of smoke detection equipment).

3. If it is determined that there could be a definite safety hazard that cannot be overcome, then the fumigator will refuse to proceed. He will fill out a FUMITOXIN "Refusal to Fumigate Form" and forward a copy to the corporate office in Alhambra, California.

4. Should the prefumigation inspection confirm that the vessel or portions thereof can be fumigated without apparent hazard to the crew, a prefumigation meeting is to be convened with the Captain and/or his designated officers. At this meeting, the ranking ship's officer, FGIS Inspector (if appropriate) and elevator operator will each be given:

   (a) An executed copy of the "Statement of Vessel Suitability for Fumigation and Fumigant Application Compliance" (to be signed by Fumigator in Charge).

   (b) An executed copy of the "Prefumigation Notice" (to be signed by Officer in Charge of Vessel and Fumigator in Charge).

   (c) A copy of the "Precautions During Voyage Notice."

   (d) A copy of the registered FUMITOXIN fumigant label.

   Copies of (a), (b), and (c) are available in Arabic, Chinese, Dutch, French, German, Greek, Japanese, Norwegian, Polish, Russian, or Spanish. The fumigator will provide the vessel representative with such foreign language copies as appropriate.

5. The fumigator shall discuss each aspect of the fumigation with the ship's designated officers explaining very carefully and fully:

   (a) Labeling
   (b) Symptoms of hydrogen phosphide poisoning
   (c) Emergency first aid treatment
   (d) Application procedures
   (e) Required exposure time
   (f) How to abort the fumigation (if it became necessary)
   (g) Precautions to be observed during voyage
   (h) Aeration procedures
   (i) Proper use of personal respiratory protection (fumigator shall ascertain that two (2) full face gas masks and phosphine canisters or self-contained breathing apparatus are on board and that at least two (2) crew members know how to use them).
   (j) Proper use of gas detection equipment - Two (2) such devices with appropriate testing tubes for phosphine must be left on board and at least two (2) crew members must be trained to use them.

B. APPLICATION

The fumigator shall:

1. Ascertain that all openings leading from the spaces to be fumigated (except cargo hatch covers) are sealed.

2. Determine cubic content of each hold to be treated. Wing tanks must be included in cubic content calculations unless they are to remain empty and are sealed off from the main holds.

3. Make sure that all fumigant needed is brought on board and the cases are opened ready for use. The fumigant must not be left unattended at any time.

4. Commence fumigant application only after the loading of a hold has been completed.

5. Apply the fumigant to bulk commodities at a dosage of 30 - 60 tablets or 165 - 300 pellets per 1000 cubic feet of hold space. The fumigant should be applied uniformly across the commodity or be probed beneath the surface. Probing is strongly recommended as this helps to delay and reduce gas loss from the headspace over the grain should high winds or leakage around the hatch covers be encountered at sea.

   Apply the fumigant to bagged commodities at a dosage rate of 30 - 60 tablets or 100 - 300 pellets per 1000 cubic feet of hold space. Be sure the fumigant is attached to a substantial support, and in the case of processed foods or feeds, be sure neither the fumigant, or its residue come into contact with the commodity.

6. Close the hatch covers immediately after application is completed. Post DANGER signs on hatch covers and on all other entrances to the fumigated holds.

7. Hold a post fumigation meeting with the Captain and/or Mate of the vessel. At this time the fumigator will re-emphasize all precautions to be observed in transit, including the monitoring of all occupied areas for possible gas leakage. The Captain will also be requested to see that following the unloading of the fumigated cargo, all warning signs will be removed and destroyed.

8. Complete a "Post Fumigation Notice" and forward one copy of all documents to PESTCON SYSTEMS, INC.

SPECIMEN COPIES OF REQUIRED SHIPBOARD FORMS

* * * PRECAUTIONS DURING VOYAGE NOTICE * * *

SUGGESTED MINIMUM PRECAUTIONS DURING VOYAGE:

Generally speaking, crew members are free to move about the vessel during the voyage but the following minimum precautions should be observed:

(a) Do not enter fumigated holds.

(b) Should an odor of hydrogen phosphide be detected or suspected in an occupied area of the vessel, evacuate the area and check for the presence of hydrogen phosphide using appropriate respiratory protection equipment and a gas testing device. These items are on board and the Captain or his designated representative is familiar with their use. Should a leak be found, seal it with tape or caulking on the exterior side of the space under fumigation. Wear respiratory protection during this operation.

(c) Do not open fumigated holds to commence aeration until a few hours before the vessel is ready to unload. If the vessel is equipped with power ventilators, these should be turned on to assist in the aeration process. Do not enter holds during aeration process until a gas reading taken over the grain surface indicates that it is safe to do so.

SUGGESTED MINIMUM PRECAUTIONS TO BE OBSERVED DURING DISCHARGE OF THE CARGO:

Hydrogen phosphide in the air space above the grain in the holds will readily dissipate when the hatches are opened. There may be some gas remaining below the surface of the grain which will disappear as discharge continues.

However, should it be necessary for workers to enter fumigated holds to unload the grain, test the air directly above the grain in the vicinity of where the men will be working. Should gas be detected, remove workers and allow additional time for aeration.

White Copy - Captain of Vessel
Yellow Copy - FGIS
Pink Copy - Elevator
Gold Copy - Applicator

REFUSAL OF IN-TRANSIT SHIPBOARD FUMIGATION

The fumigation of the cargo of _____ located in holds _____, _____, _____, _____, _____, _____, _____, on the vessel _____ was requested by the _____ elevator in _____ as of _____ 19 _____. An inspection of the vessel was conducted and it was determined that a fumigation of the cargo could not be performed without exposing the ship's crew to undue safety hazards at sea. The fumigation of the above named vessel was refused on _____ 19 _____.

PESTCON SYSTEMS, INC.

_____
Fumigator in Charge

STATEMENT OF VESSEL SUITABILITY FOR FUMIGATION AND FUMIGANT APPLICATION COMPLIANCE

TO: CAPTAIN OR OFFICER IN CHARGE OF _____
(Name of Vessel)

It is hereby certified that:

(a) I have personally inspected the visible portions of the cargo holds to be fumigated with FUMITOXIN fumigant on the vessel _____ _____ on _____, 19 _____ and find them suitable for treatment.

(b) The application of the fumigant is in accordance with the EPA registered label and/or manufacturer's instructions.

(c) The application of FUMITOXIN fumigant containing 55% Aluminum Phosphide as the active ingredient was made to grain on this vessel on _____, 19 _____. Hydrogen phosphide (phosphine) gas is liberated from the tablets or pellets. The following holds were treated:

HOLD NUMBER	QUANTITY OF FUMIGANT USED	DIMENSION OF HOLD IN CU. FT.

(d) Following application of the fumigant, the hatch covers were closed and entrances to the fumigated spaces were placarded with appropriate DANGER signs.

Signed by:_____

For:_____

One copy of the above to: Captain of the Vessel, FGIS, Elevator and Applicator

TO: PERSON IN CHARGE OF _____
(Name of Vessel)

You are hereby notified that FUMITOXIN fumigant will be used to treat grain in holds _____, _____, _____, _____, _____, _____, _____, between the hours of _____ and _____ on _____, 19 _____.

In accordance with Federal Regulations the following information is provided:

(a) The EPA registered FUMITOXIN label and labeling for shipboard fumigation of grain are attached.

(b) The symptoms of exposure to hydrogen phosphide (phosphine) are:
Sensation of cold, fatigue, pain and tightness in upper chest, nausea, diarrhea, stomach cramps, loss of equilibrium. Severe poisoning results in cyanosis, agitation, ataxia, and unconsciousness.

(c) Emergency first aid treatment for inhalation of the gas is:
Remove victim to fresh air. Make him lie down and keep him warm. Treat as for shock. Call a physician as soon as possible.
Make no antidotal use of fats, oils, butter, or milk.
The following measures are suggested for use by the physician in accordance with his own judgement:
Should patient suffer from vomiting or increased blood sugar, appropriate solutions should be administered. Treatment with oxygen breathing equipment is recommended as is the administration of a cardiac stimulant.
In cases of severe poisoning where pulmonary edema is observed, steroid therapy should be considered and close medical supervision is recommended. Blood transfusions may also be necessary.
Bed rest is recommended for a minimum of 48 hours.

(d) Personal respiratory protection for two men and gas testing equipment must be on board, and at least two crew members must be familiar with its use.

(e) The threshold limit value for phosphine in spaces that are considered safe for occupancy is 0.3 ppm (parts per million).

I hereby acknowledge receipt of the following documents:

1. PREFUMIGATION NOTICE
2. STATEMENT OF VESSEL SUITABILITY FOR FUMIGATION AND FUMIGANT APPLICATION COMPLIANCE
3. PRECAUTIONS DURING VOYAGE NOTICE
4. REGISTERED FUMITOXIN FUMIGANT LABEL AND LABELING

I further confirm that the fumigator and I have discussed the structure of this vessel and it is such that there are no known means for gas to escape from cargo holds to areas occupied by the crew.

Signature of Captain or Officer in Charge of Vessel _____

Applicator in charge of fumigation _____

Date: _____, 19 _____.

White copy - Captain of Vessel
Yellow copy - FGIS Inspector
Pink copy - Elevator
Gold copy - Applicator

ACCEPTED
with COMMENTS
In EPA Letter Dated:

MAR 16 1987

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 5857-2

RESTRICTED USE PESTICIDE
DUE TO ACUTE INHALATION TOXICITY OF HIGHLY TOXIC HYDROGEN PHOSPHIDE (PHOSPHINE, PH_3) GAS

For retail sale to and use only by Certified Applicators for those uses covered by the applicators certification or persons trained in accordance with the attached product manual working under the direct supervision and in the physical presence of the Certified Applicator. Physical presence means onsite or on the premises. Refer to Pestcon Systems, Inc. Applicator's Manual for complete instructions for the safe use of this product.

FUMITOXIN

TABLETS - 5857-1
PELLETS - 5857-2

FOR USE AGAINST LISTED INSECTS WHICH INFEST STORED COMMODITIES, SPECIFIED PROCESSED FOODS, & ANIMAL FEEDS

ACTIVE INGREDIENT:	
Aluminum Phosphide	55%
Inert Ingredients	45%
	100%

KEEP OUT OF REACH OF CHILDREN
DANGER/PELIGRO - POISON

PESTCON SYSTEMS, INC.

BOX 469, ALHAMBRA, CALIFORNIA 91802
TELEPHONE: (213) 283-2761
TELEX 698635

EPA EST. NO. 46060-CI-04

INDEX...

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I. CHEMICAL AND PHYSICAL PROPERTIES OF FUMITOXIN FUMIGANT

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A. Chemical formula for hydrogen phosphide is PH_3 or H_3P.

B. FUMITOXIN fumigant's active ingredient pure, finely ground aluminum phosphide, liberates hydrogen phosphide (phosphine) gas via the following chemical reaction: $AlP + 3H_2O$----- $Al(OH)_3 + PH_3$.

C. FUMITOXIN also contains ammonium carbamate which liberates ammonia and carbon dioxide as follows:
$NH_2 COONH_4$-------- $2NH_3 + CO_2$
These gases are essentially nonflammable and act as inerting agents to reduce fire hazards. The pungent smelling ammonia gas serves as an initial warning agent, and begins to develop immediately upon opening.

D. FUMITOXIN is prepared in the form of tablets, pellets and bags. For use directions of bags, see the FUMITOXIN aluminum phosphide bag instruction labeling.

E. Upon exposure to air, FUMITOXIN fumigants begin to react slowly with atmospheric moisture to produce small quantities of hydrogen phosphide (phosphine) gas. This reaction gradually accelerates and then tapers off again as the aluminum phosphide decomposes.

F. The rate of decomposition of the tablets and pellets varies depending on the moisture and temperature. For example, when moisture and temperature of the fumigated commodity are high, decomposition may be complete in less than 3 days. However, with ambient temperatures lower than 15 degrees C (60 degrees F), grain moisture lower than 10% or relative humidity lower than 25%, decomposition may require 5 days or more.

G. The tablets weigh approximately 3 grams and release 1 gram of gaseous hydrogen phosphide. They are spherical in shape, approximately 5/8 of an inch in diameter, and are packaged in bulk in resealable, seamless aluminum flasks which contain approximately 100, or larger flask of approximately 500 tablets each.

H. Pellets are spherical in shape, approximately 3/8 of an inch in diameter, weigh approximately 0.6 grams, and release 0.2 grams of hydrogen phosphide. They are packaged in resealable aluminum flasks containing approximately 1,660 pellets, or larger flasks containing approximately 2,490 pellets each.

I. After decomposition FUMITOXIN leaves a grey-white powder composed almost entirely of non-poisonous aluminum hydroxide and a small amount of unreacted aluminum phosphide. This is not considered a hazardous waste. The slight trace of aluminum phosphide decomposes when raw commodities are moved. Following space fumigation and fumigations of processed foods, this powder may be disposed of as outlined in Section _____.

Storage of FUMITOXIN Aluminum Phosphide Products

A. Store in a dry, well ventilated area, away from heat and under lock and key. Keep away from irresponsible people and children. Post as a pesticide storage area. Do not contaminate water, food or feed by storing pesticides in the same area used to store these commodities.

B. Do not store in buildings where humans or domestic animals reside.

C. FUMITOXIN tablets and pellets are supplied in relatively gas tight resealable aluminum flasks. Do not expose the product to atmospheric moisture any longer than is necessary. Reseal tightly before returning flasks to storage; mark the flask opened and partially used.

D. The shelf life of [illegible]MITOXIN is virtually unlimited as long as the containers are kept tightly sealed.

II. PRECAUTIONARY STATEMENTS

A. Physical and Chemical Hazards

Aluminum phosphide tablets, pellets and partially spent dust will release hydrogen phosphide if exposed to moisture from the air or if it comes into contact with water, acids and many other liquids. Piling of tablets, pellets or dust from their fragmentation may cause a temperature increase and confine the release of gas so that ignition could occur.

It is recommended that you open aluminum phosphide products in open air or near a fan which exhausts outside immediately. Never open in a flammable atmosphere because on rare occasions it may flash. When opening, point the container away from the face and body. These precautions will also reduce the applicators exposure to hydrogen phosphide (phosphine) gas.

Pure hydrogen phosphide (phosphine) gas is practically insoluble in water, fats and oils, and is stable at normal fumigation temperatures. However, it may react with certain metals and cause corrosion, especially at higher temperatures and relative humidities.

Metals such as copper, brass, and other copper alloys, and precious metals such as gold and silver are susceptible to corrosion by phosphine, especially at high tempertures and humidity. Thus items such as small electric motors, smoke detectors, brass sprinkler heads, batteries and battery chargers, forklifts, temperature monitoring systems, electrical switch gear, communication devices, computers, calculators, watches, and other electronic equipment should be protected or removed before fumigation. Hydrogen phosphide will also react with certain metallic salts and, therefore, sensitive items such as photographic film, copying papers and some inorganic pigments, etc. should not be exposed.

B. Hazards to Humans and Domestic Animals

DANGER: FUMITOXIN tablets, pellets or dust can be fatal if swallowed. Do not get in eyes, on skin or on clothing. Do not eat, drink or smoke while handling aluminum phosphide fumigants. When a sealed container is opened, allowing material to come in contact with moisture, water or acids, toxic phosphine gas will be released. If a garlic odor is detected, refer to section on ~~respiratory protection or applicator/worker exposure~~ Industrial Hygiene Monitoring Guide for appropriate monitoring procedures. Pure phosphine gas is odorless; the odor is due to a contaminant. Since an odor may not be detected under certain circumstances, the absence of garlic odor does not mean that phosphine gas is absent. Observe proper application, aeration, reentry and disposal procedures specified elsewhere in the labeling to prevent overexposure.

C. Statement of Practical Treatment

Symptoms of overexposure are headache, dizziness, nausea, difficult breathing, vomiting, and diarrhea. In all cases of overexposure get medical attention immediately. Take victim to a doctor or emergency treatment facility.

If excessive amounts of gas from aluminum phosphide are inhaled:

Get exposed person to fresh air. Keep warm and make sure person can breath freely. If breathing has stopped, give artificial respiration by mouth to mouth or other means of resuscitation. Do not give anything by mouth to an unconscious person.

If aluminum phosphide pellets, tablets or powder are swallowed:

Drink or administer one or two glasses of water and induce vomiting by touching back of throat with finger, or if available administer syrup of ipecac. Do not give anything by mouth if victim is unconscious or not alert.

If powder or granules of aluminum phosphide get on skin or clothing:

Brush or shake material off clothes in a well ventilated area. Check that all pockets and cuffs are empty. Allow clothes to aerate in the ventilated area prior to laundering. Do not leave contaminated clothing in occupied and/or confined areas such as automobiles, vans, motel rooms, etc. Wash contaminated skin thoroughly with soap and water.

If dust from pellets or tablets get in eyes:

Flush with plenty of water. Get medical attention.

III. SUMMARY OF GOOD SAFE. 'RACTICES

A. Carefully read all labeling and follow instructions explicitly.

B. Never work alone when applying fumigant from within an enclosed area.

C. Never allow untrained personnel to apply FUMITOXIN fumigants.

D. NIOSH/MSHA respiratory protection must be available at the site of application when applying fumigant from within an enclosed area. Respiratory protection need not be available for uses such as outdoor application.

E. Wear dry gloves of cotton or other appropriate material when applying FUMITOXIN tablets and pellets.

F. It is ~~recommended~~ preferable to open containers in open air or near a fan that exhausts outside immediately. Never open in a flammable atmosphere.

G. Do not allow FUMITOXIN to contact liquid water or to pile up.

H. Dispose of empty containers and spent residual dust in a proper manner consistent with the label instructions.

I. Post "WARNING" signs on fumigated areas.

J. Notify appropriate company employees and provide relevant safety information to local officials annually for use in the event of an emergency.

K. Hydrogen phosphide fumigants are NOT to be used for vacuum fumigations.

L. Exposure to hydrogen phosphide must not exceed the 8 hour TWA of 0.3 ppm during application or a maximum concentration of 0.3 ppm after application is completed.

M. Fumigated areas must be aerated to 0.3 ppm hydrogen phosphide or less, prior to reentry by unprotected workers.

N. Finished foods and feeds which have been fumigated with FUMITOXIN must be aerated 48 hours prior to offering to the end consumer.

O. Transfer of a treated commodity to another site without aeration, as in railcars, is permissible provided the new site is placarded.

P. Do not fumigate when commodity temperature is below 40° F (5° C).

Q. During transfer and processing of unaerated commodities, workers must not be exposed to levels of hydrogen phosphide above 0.3 ppm.

R. It is recommeded to aerate contaminated clothing in a well ventilated area prior to washing. Check that all pockets and cuffs are empty.

S. Keep container tightly closed except while removing product for application.

T. Protect copper, silver, gold and their alloys from corrosive exposure to hydrogen phosphide.

U. Pellets and/or tablets or their reacted residues must not come into contact with any processed food with the exception that both can be added directly to processed brewers rice, malt, and corn grits used in the manufacture of beer.

V. Do not re-use aluminum phosphide containers for any purpose other than recycling or reconditioning.

W. OSHA recommends that pre-exposure screening of employees be conducted to detect impaired pulmonary function.

RESPIRATORY PROTECTION

A. WHEN RESPIRATORY PROTECTION MUST BE WORN

NIOSH/MSHA approved respiratory protection must be worn during exposure to concentrations in excess of permitted limits or when concentrations are unknown.

B. PERMISSIBLE GAS CONCENTRATION RANGES FOR RESPIRATORY PROTECTION DEVICES

A NIOSH/MSHA approved, full face gas mask, hydrogen phosphide canister combination may be used at levels up to 15 ppm or to escape from levels up to 1500 ppm. Above this level or in situations where the hydrogen phosphide concentration is unknown, a NIOSH/MSHA approved, self-contained breathing apparatus (SCBA) or its equivalent must be used. The NIOSH/OSHA Pocket Guide, 8-85, DHEW/NIOSH 78-210, lists these and other types of approved respirators and the concentration limits of which they may be used.

C. REQUIREMENTS FOR AVAILABILITY OF RESPIRATORY PROTECTION

Respiratory protection must be available at the site of application in case it is needed when applying FUMITOXIN tablets and pellets from within the structure being fumigated. An approved full face gas mask, phosphine canister combination or self-contained breathing apparatus (SCBA) or its equivalent must be available at the site of application. If SCBA or its equivalent is not available at the application site, it must be available locally, for example, at a fire station or rescue squad.

Respiratory protection need not be available for applications from outside the area to be fumigated such as addition of tablets or pellets to automatic dispensing devices, etc., if exposures above the permitted limit will not be encountered.

Respiratory protection need not be available for outdoor applications.

If monitoring equipment is not available on a farm and application cannot be done from outside the structure, an approved canister respirator must be worn during application from within the enclosed indoor area.

GAS DETECTION EQUIPMENT

There are several re. ole devices marketed. One typ s the hand pump when used in conjunction with the appropriate detector tube. They are portable, simple devices and do not require intensive training or elaborate supporting equipment to operate. Furthermore, they are inexpensively adaptable to remote monitoring procedures and will measure concentrations of hydrogen phosphide in air in trace amounts on up. Use instructions are enclosed with each purchase. Consult your local supplier of such equipment or contact Pestcon Systems, Inc. for more information.

APPLICATOR AND WORKER EXPOSURE

A. HYDROGEN PHOSPHIDE EXPOSURE LIMITS

Exposure to hydrogen phosphide must not exceed the 8 hour TWA of 0.3 ppm for applicators and workers during application. Application is defined as the time period covering the opening of the first container, applying the appropriate dosage of fumigant and closing up the site to be fumigated. All persons in the treated site and in adjacent indoor areas are covered by this exposure standard.

After application is completed worker or applicator exposure must not exceed 0.3 ppm maximum concentration. Such exposures may occur because of leakage into enclosed areas from fumigation sites, during reentry or during transfer of unaerated commodity.

B. APPLICATION OF FUMIGANT

Depending upon temperature and humidity, FUMITOXIN tablets and pellets release hydrogen phosphide gas slowly upon exposure to moisture from the air. This release is often slow enough to permit applicators to deposit fumigant in the desired areas and then vacate the premises without significant exposure to the gas. If the fumigator's exposure exceeds the 8 hour TWA of 0.3 ppm, approved respiratory protection must be worn. Gas concentration measurements for safety purposes must be made using low level detector tubes or other suitable low level detection equipment. See the "Industrial Hygiene Monitoring" section below. Information on hydrogen phosphide (phosphine, PH3) detector tubes may be obtained from Pestcon Systems, Inc.

C. LEAKAGE FROM FUMIGATED SITES

Hydrogen phosphide is highly mobile and given enough time may penetrate seemingly gas-tight materials such as concrete and cinder block. Therefore, adjacent, enclosed areas likely to be occupied should be examined to ensure that significant leakage has not occurred. Sealing of the fumigated site and/or air flow in the occupied areas must be sufficient to prevent exposures exceeding the TLV's.

D. AERATION AND REENTRY

If the area is to be entered after fumigation, it must be aerated until the level of hydrogen phosphide gas is 0.3 ppm or below. The area or site must be monitored to ensure that liberation of gas from the treated commodity does not result in the development of unacceptable levels of hydrogen phosphide. Do not allow reentry into treated areas by any person before this time unless protected by an approved respirator.

E. HANDLING UNAERATED COMMODITIES

Following the required exposure time for fumigation, transfer and processing of a treated commodity prior to complete aeration is permissible, however, workers must not be exposed to hydrogen phosphide in excess of the permitted exposure limits.

F. INDUSTRIAL HYGIENE MONITORING

It is recommended that hydrogen phosphide exposure be documented in an operation log or manual for each site and operation where exposure may occur. The purpose of this monitoring is to prevent excessive exposure and to determine when and where respiratory protection is required. Once exposures have been adequately characterized, subsequent monitoring is not routinely required. However, spot checks should be made occasionally, especially if conditions significantly change, or if an unexpected garlic odor is detected. If monitoring shows that workers are exposed to concentrations in excess of the permitted exposure limits, then engineering controls (such as forced air ventilation) and/or appropriate work practices should be used where possible to reduce exposure below permitted limits.

V. DIRECTIONS FOR USE

A. General Use Directions

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

2. FUMITOXIN tablets and pellets are Restricted Use Pesticides due to the acute inhalation toxicity of hydrogen phosphide (phosphine, PH_3) gas.

3. FUMITOXIN is a highly hazardous material and may be used only by individuals trained in its proper use. Before using, read and follow all label precautions and directions on the label and in labeling.

   Additional copies of this Manual are available from:
   PESTCON SYSTEMS, INC.
   P.O. Box 469
   Alhambra, California 91802
   (213) 283-2761
   TELEX 698635

4. At least two trained persons must be present when FUMITOXIN pellets or tablets are applied from within the enclosed indoor area being treated or during reentry into a fumigated or partially aerated site. Only one trained person is required to be present when the fumigant is applied from outside the area being fumigated.

5. Prior to applying this product you should determine (1) if the structure can be made sufficiently gas tight, (2) if recording of gas readings will be required, (3) how to efficiently and safely apply the fumigant and (4) emergency procedures.

6. Shipholds, barges, containers on ships, railroad cars and containers shipped piggyback by rail may be fumigated in transit. However, fumigated trucks, vans, trailers and similar transport vehicles shall not be moved over public roads or highways until they are aerated.

7. Do not fumigate commodities with this product when commodity temperature is below 40°F (5°C).

8. Wear gloves of cotton or other suitable material while handling FUMITOXIN tablets and pellets. Wash hands thoroughly after use.

9. Hydrogen phosphide gas may flash at concentrations above its flammable limit. Therefore, always open FUMITOXIN containers in outdoor air and never in a flammable atmosphere. This precaution will not only prevent harm in the unlikely event of a flash but will reduce the applicators exposure to hydrogen phosphide gas.

10. Piling of tablets, pellets, dust from their fragmentation, or addition of liquid water to FUMITOXIN may cause a temperature increase and confine the release of gas so that ignition could occur.

11. As much as possible, protect unused FUMITOXIN from excessive exposure to atmospheric moisture during application. Tightly reseal and mark the aluminum flask as opened and partially used prior to returning to storage.

12. Respiratory protection approved for the concentration to which the fumigator will be exposed must be available if FUMITOXIN is to be

applied from within an enclosed indoor area. Respiratory protection may not be available for uses such as outdoor application, addition of tablets or pellets to automatic dispensing devices, etc., if exposures above the TLV's will not be encountered.

A NIOSH/MSHA approved, full-face gas mask - hydrogen phosphide canister combination may be used at levels up to 15 ppm. Above this level or in situations where the hydrogen phosphide concentration is unknown, a NIOSH/MSHA approved, self-contained breathing apparatus (SCBA) or its equivalent must be used.

13. Notify appropriate company employees and provide relevant safety information to local officials annually for use in the event of an emergency.

B. USE PATTERN

FUMITOXIN has been found effective against the following stored products insects and their preadult stages - that is, eggs, larvae and pupae:

almond moth
Angoumois grain moth
bean weevil
cadelle
cereal leaf beetle
cigarette beetle
confused flour beetle
dermestid beetle
dried fruit beetle
dried fruit moth
European grain moth
flat grain beetle
fruitfly
granary weevil
greater wax moth
hairy fungus beetle
hessian fly
Indian meal moth
Khapra beetle
lesser grain borer
maize weevil
Mediterranean flour moth
pink bollworm
raisin moth
red flour beetle
rice weevil
rusty grain beetle
saw-toothed grain beetle
spider beetle
tobacco moth
yellow meal worm
Africanized and honeybee infested with tracheal mites

Although it is possible to achieve total control of the listed insect pests, this is frequently not realized in actual practice. Factors contributing to less than total control are leaks, poor gas distribution, unfavorable exposure conditions, etc. In addition, some insects are less susceptible to hydrogen phosphide than others. If maximum control is to be attained, extreme care must be taken in sealing, the higher dosages must be used, exposure periods lengthened, proper application procedures followed and temperature and humidity conditions must be favorable.

COMMODITIES WHICH MAY BE FUMIGATED WITH FUMITOXIN

FUMITOXIN may be used for fumigation of listed raw agricultural commodities, animal feed and feed ingredients, processed foods, tobacco and certain other non-food items.

RAW AGRICULTURAL COMMODITIES AND ANIMAL FEED AND FEED INGREDIENTS WHICH MAY BE FUMIGATED WITH FUMITOXIN

FUMITOXIN tablets and pellets may be added directly to animal feed, feed ingrdients and raw agricultural commodities stored in bulk. For those commodities not stored in bulk, FUMITOXIN may be placed in moisture permeable envelopes, on trays, etc., and fumigated as with processed foods.

almonds
animal feed & feed ingredients
barley
Brazil nuts
cashews
cocoa beans
coffee beans
corn
cottonseed
dates
filberts
flower seed
grass seed
millet
oats
peanuts
pecans
pistachio nuts
popcorn
rice
rye
safflower seed
sesame seed
seed & pod vegetables
sorghum
soy beans
sunflower seeds
triticale
vegetable seed
walnuts
wheat
~~wild rice~~

PROCESSED FOODS WHICH MAY BE FUMIGATED WITH FUMITOXIN

The listed processed foods may be fumigated with FUMITOXIN. Under no condition shallany processed food or bagged commodity come in contact with FUMITOXIN tablets, pellets or residual dust except that FUMITOXIN may be added directly to processed brewer's rice, malt and corn grits for use in the manufacture of beer.

Processed Candy and Sugar
Cereal Flours and Bakery Mixes
Cereal Foods (including cookies, crackers, macaroni, noodles, pasta, pretzels, snack foods and spaghetti)
Processed Cereals (including milled fractions and packaged cereals)
Cheese and Cheese Byproducts
Chocolate and Chocolate Products (assorted chocolate, chocolate liquor, cocoa, cocoa powder, dark chocolate coating and milk chocolate)
Processed Coffee
Corn Grits
Cured, Dried and Processed Meat Products and Dried Fish
Dates
Dried Eggs and Egg Yolk Solids
Dried Milk, Dried Powdered Milk, Nondairy Creamers, and Nonfat Dried Milk
Dried or Dehydrated Fruits (apples, dates, figs, peaches, pears, prunes, raisins and sultanas)
Figs
Malt
Processed Herbs, Spices, Seasonings and Condiments
Processed Nuts (almonds, apricot kernals, Brazil nuts, cashews, filberts, pecans, pistachio nuts and walnuts)
Processed Oats (including oatmeal)
Peanuts
Rice (brewers rice grits, enriched and polished)
Soybean Flour and Milled Fractions
Processed Tea
Dried and Dehydrated Vegetables (beans, carrots, lentils, peas, potato flour, potato products and spinach)
~~Wildrice~~ → Wild rice
Yeast (including primary yeast)

NONFOOD COMMODITIES WHICH MAY BE FUMIGATED WITH FUMITOXIN

Processed or Unprocessed Cotton, Wool, and Other Natural Fibers, Cloth or Clothing
Feathers
Human hair, Rubberized Hair, Vulcanized Hair, Mohair, Animal Hide, Furs
Tobacco
Wood, Cut Trees, Wood Chips and Wood, and Bamboo Products
Paper and Paper Products
Dried Plants and Flowers, Hay or Straw
Seeds (grass seed, ornamental herbaceous plant seed and vegetable seed)

FUMIGATION EXPOSURE GUIDEL.

The following table may be used as a guide in determining the minimum length of the exposure period at the indicated temperatures.

TEMPERATURE TO WHICH FUMIGANT AND INSECTS ARE EXPOSED	MINIMUM EXPOSURE PERIOD FOR FUMITOXIN	
	PELLETS	TABLETS
Below 40° F (5°C)	Do Not Fumigate	Do Not Fumigate
40° - 53° F (4-12°C)	8 days (192 hours)	10 days (240 hours)
54° - 59° F (12-15°C)	4 days (96 hours)	5 days (120 hours)
60° - 68° F (16-20°C)	3 days (72 hours)	4 days (96 hours)
above 68° F (20°C)	2 days (48 hours)	3 days (72 hours)

The length of the fumigation must be long enough so as to provide for adequate control of the insect pests which infest the commodity being treated. It will be necessary to lengthen the fumigation at lower temperatures and relative humidities (or grain moisture) since insects are more difficult to control under these conditions.

The fumigation period should also be long enough so that the generation of hydrogen phosphide gas has essentially ceased and worker exposure minimized during further storage and/or processing.

There is little to be gained by extending the exposure period if the structure to be fumigated has not been carefully sealed. This is required to insure that adequate gas levels are retained. Proper application procedures must be followed to provide satisfactory distribution, retention and results.

The exposure periods in the above table are minimum periods and should not be shortened for any reason other than when it may be necessary to abort the fumigation.

RECOMMENDED DOSAGE RATES

The succ sful conclusion a fumigation depends on the c. entration being held for a sufficient length of time or exposure period. With hydrogen phosphide, minimum exposure times are required because of the means of generating the gas from solid material and the biological action of the insect. For successful results against all stages, exposure times are not generally possible in less than 48 hours.

It is beyond the scope of this brochure to take into account all conditions prevailing in all situations where FUMITOXIN is used. Construction and tightness of storages vary considerably, so do climatic conditions. Therefore, we can only give a general guidance, which explains the wide range of the following recommended dosage rates.

Dosage rate depends primarily upon the following factors:

-Type of storage
-Pests to be controlled
-Commodity temperature

Dosage is calculated per 1,000 cubic feet or per 1,000 bushels.

PRODUCT	PER 1,000 CU. FT.	PER 1,000 BUSHELS
Pellets	100 - 500	125 - 625
Tablets	20 - 145	25 - 180

These dosages are not to be exceeded. It is important to be aware that a shortened exposure period cannot be compensated by an increased dosage of hydrogen phosphide.

Long fumigation experience has shown the following recommendations to be generally reliable. Extremely adverse conditions may require deviation from these recommended dosage rates. Contact your Pestcon Systems, Inc. representative for assistance.

	TYPE OF STORAGE	RECOMMENDED DOSAGE
a.	SILOS	
	Large vertical silo bins which are relatively gas tight (e.g., steel), or well constructed concrete bins.	40 - 180 tablets per 1,000 bushels 120 - 300 pellets per 1,000 bushels (When distributed by automatic dispenser)
	FARM BINS (BUTLER TYPE)	
	Well constructed and reasonably gas tight.	90 - 180 tablets per 1,000 bushels 200 - 600 pellets per 1,000 bushels

Farm bins made of wood or loosely constructed metal are rather untight; even a considerable increase in dosage may not give complete kill. Such structures should be covered with polyethylene sheeting, permitting the dosage to be considerably reduced.

	TYPE OF STORAGE	RECOMMENDED DOSAGE
b.	Bulk stored commodities in flat stores, steel bins, bunkers, etc.	90 - 180 tablets per 1,000 bushels 270 - 540 pellets per 1,000 bushels
c.	Loosely piled commodity stored under temporary relatively gas tight covering.	90 - 180 tablets per 1,000 bushels 270 - 540 pellets per 1,000 bushels
d.	Packaged commodities (bagged grain, processed foods, etc.) in sealable enclosure.	30 - 90 tablets per 1,000 cubic feet 165 - 300 pellets per 1,000 cubic feet
e.	Nuts or dates in bags or storage boxes.	20 - 40 tablets per 1,000 cubic feet 100 - 200 pellets per 1,000 cubic feet
	Nuts or dates in bulk.	30 - 40 tablets per 1,000 cubic feet 150 - 200 pellets per 1,000 cubic feet
f.	Railcars	45 - 145 tablets per 1,000 cubic feet 225 - 500 pellets per 1,000 cubic feet
g.	Space fumigation such as cereal mills, feed mills, food processing plants & warehouses.	20 - 145 tablets per 1,000 cubic feet 100 - 225 pellets per 1,000 cubic feet
h.	Stored Tobacco	20 - 40 tablets per 1,000 cubic feet 100 - 165 pellets per 1,000 cubic feet
i.	Non-food products	30 - 90 tablets per 1,000 cubic feet 150 - 450 pellets per 1,000 cubic feet
j.	Stored beehives, supers and other beekeeping equipment for wax moth control and Africanized and Honeybees infested with trachael mites and foulbrood.	30 - 45 tablets per 1,000 cubic feet 150 - 225 pellets per 1,000 cubic feet
k.	Rodent burrows	2 - 4 tablets per burrow 10 - 20 pellets per burrow
l.	Shipholds	30 - 60 tablets per 1,000 cubic feet-BULK 30 - 60 tablets per 1,000 cubic feet-BAGGED 165-300 pellets per 1,000 cubic feet-BULK 100-300 pellets per 1,000 cubic feet-BAGGED
m.	Spices in small containers	1 - 2 pellets per 10 cubic feet

The wide range of dosages listed above is required to handle the variety of fumigation situations encountered in practice. Somewhat higher dosages are usually recommended under cooler, drier conditions where exposure periods are relatively short. However, the major factor in selection of dosage is the ability of the structure to hold hydrogen phosphide gas during the fumigation. A good illustration of this point is comparison of the low dosages required to treat modern, well-sealed warehouses; with the higher range used for poorly constructed buildings that cannot be sealed adequately.

USING TABLETS OR PELLETS

The question often is asked why there may be a difference in the total amount of aluminum phosphide in dosage recommendations between tablets and pellets. Contrary to what might be expected, it is not always the best decision to assume that you use five times as many pellets (which weigh 0.6 grams each) as tablets (which weigh 3 grams each). Because they are smaller, pellets decompose more quickly and almost always give a higher peak concentration much sooner than tablets. Often you have a different distribution pattern. These and other factors thus suggest there often will be a difference in dosage rates between tablets and pellets.

To illustrate this, the chart on the left summarizes the results of a test fumigation of two bins of identical size, one treated with 22 tablets (66 grams) per 1,000 bushels and the other treated with 110 pellets (66 grams) per 1,000 bushels. The results show a clear difference in the amount of gas available and the concentration reached using identical weights of aluminum phosphide. Peak concentration of the pellet treated bins were over three times that of the tablet treated bin (770 ppm vs 230 ppm). For warehouse and flat storage buildings, tablets often (but not always) are the preferred choice.

1. **FARM STORAGE FUMIGATION**

a. Equipment Necessa

1. FUMITOXIN tablets/pellets
2. 5' to 7' probes, 1-1/4" diameter, PVC rigid tubing is recommended.
3. Grain sampling probe with pan, screen and thermometer (optional).
4. Gloves of cotton or other appropriate material (washable).
5. Aluminum phosphide warning signs.
6. Polyethylene sheeting.
7. Detection equipment, See page _____.
8. Approved respiratory protection equipment. See page _____.

b. Steps in FUMITOXIN Fumigation:

1. Contact your supplier for detailed information, assistance and training outlines.
2. Read the label on the container and all supplemental labeling.
3 Determine location of infestion.
4. Determine number of bushels to be treated.
5. Determine number of tablets/pellets required for treatment as follows:

DOSAGE CHART

TYPE OF STORAGE	GRAIN TEMP.	TABLET DOSAGE PER 1,000 BUSHELS	PELLET DOSAGE PER 1,000 BUSHELS
Concrete elevators or steel tanks with turning facilities	60-68° F	90 - 180 tablets	200 - 450 pellets
	Over 68° F	60 - 90 tablets as grain is being turned	150 - 450 pellets
Round steel bins	60-68° F	120 tablets	200 - 450 pellets
	Over 68° F	90 tablets	150 - 450 pellets
Flat stores in relatively tight building not over 30 feet in depth	60-68° F	150 tablets	150 - 450 pellets
	Over 68° F	120 tablets	150 - 450 pellets
Treatment of partial bins		120 - 180 tablets	150 - 450 pellets

6. Plan the distribution pattern for applying the tablets/pellets (keep in mind location of infestation). Contact your supplier for information on equipment to probe deeper than seven feet if this is necessary.
7. Probe tablets on 4' centers. Probe all tablets/pellets as deeply as possible, particularly with warm grain in cool climates. Convectional currents can prevent the hydrogen phosphide (phosphine) from penetrating downward.
8. Place warning signs by all access openings.
9. It is recommended that the perimeter of the bin be sprayed at ground level with an approved insecticide to help prevent reinfestation.
10. Do not enter the building for a minimum of five days after the fumigant has been applied or longer if grain is cooler than 60° F. Do not fumigate when grain temperature is below 40° F.
11. Following aeration of the building, spray grain surface with approved insecticide to discourage surface reinfestation.

NOTE: If monitoring equipment is not available on a farm and application cannot be done from outside of a structure, an approved canister respirator must be worn during application from within an enclosed indoor area.

2. FUMIGATING VERTICAL RAGE (Concrete upright bins, s bs, etc.)

a. Locate all ventilation facilities for basement/tunnel.

b. Check commodity temperature and moisture and determine required exposure time.

c. To the extent possible, seal all openings except for fill opening.

d. Calculate number of tablets or pellets required, based on quantity (bushels) of commodity to be treated.

e. Open containers in open air or near a fan which exhausts outside immediately as under certain conditions containers of aluminum phosphide may flash upon opening.

f. Tablets or pellets may be applied by hand or with an automatic dispenser to the moving grain stream. Bins requiring more than 24 hours to fill should not be fumigated by direct addition as the bin is filled. These bins should be fumigated upon completion of filling by probing.

g. Warning signs should be placed on hatch cover and discharge spout of each treated bin.

h. Employees may continue with their normal duties when FUMITOXIN fumigant is used to fumigate grain in concrete elevator bins, providing proper exposure levels are maintained.

i. Following application, basements/tunnels should always be checked for gas concentration before work starts. This can be done with detector tubes. If a concentration is detected in the basement/tunnel, it must be eliminated by natural or forced ventilation. Checking of headhouse/gallery and basement/tunnel should always be done before the elevator crews start work. Grain must not be removed prior to completion of minimum exposoure time listed in section _____ of this manual.

3. FUMIGATION OF FLAT STORAGE (BUNKERS, QUONSET BUILDINGS, LARGE STEEL TANKS, ETC.)

Structure shall not be occupied during fumigation. If the storage is within a barn, all animals must be removed for the entire period of fumigation.

a. Check the storage for tightness.

b. To the extent practical seal any vents, cracks or other leaks.

c. Determine commodity temperature, moisture and type of application to be made.

d. Determine the dosage and exposure time based on the above information.

e. Tablets are recommended for flat storage, but if necessary, pellets may be substituted. Workers should be aware of the much shortened allowable application time if pellets are used.

f. Apply tablets by using probes. Probes should be inserted at three or four foot intervals horizontally in both directions. The number of tablets per probe is determined by dividing the total number of tablets by the total number of probings to be carried out. Tablets will be dropped into the probes at intervals, as the probe is withdrawn.

g. During application of the tablets, doors and windows shall be open to create as much cross ventilation as possible. Observe proper exposure levels and proper respiratory protection requirements found elsewhere in this manual.

h. Covering the surface of the commodity with tarps or plastic sheets reduces convectional currents and gas loss, thus increasing the effectiveness of the fumigant. This cover must be removed after the fumigation is completed.

i. On completion of FUMITOXIN application and covering of commodity with tarps, close, seal and secure all doors, windows, hatches, etc.

j. Warning signs are placed on all doors and openings so they are visible from all directions.

k. After full exposure time, aerating can be accomplished by opening doors and windows from the outside and allowing a cross draft until the area is suitable for re-entry. If the enclosure must be entered to open doors and windows, two or more persons must work together wearing proper respiratory equipment. Presence of hydrogen phosphide must be determined with detector tubes. Refer to aeration, reentry and industrial hygiene monitoring sections found elsewhere in this document.

4. TRUCKS, VANS, CHAMBE , CONTAINERS, AND OTHER TRANSP(VEHICLES

a. Determine if the truck, van, chamber, container, or other transport vehicle can be made relatively gas tight.

b. Determine the volume of space to be fumigated.

c. Determine the proper dosage and exposure time.

d. Seal any vents, cracks or other leaks.

e. For raw agricultural commodities aluminum phosphide may be added directly to the raw commodity as it is loaded, or probed in after loading is completed.

f. The fumigation of processed foods in trucks, vans, containers, and other transport vehicles must be done in such a manner as to prevent contact of aluminum phosphide with the commodity or its packaging.

g. All doors and other openings are then sealed to prevent gas loss.

h. After doors and other openings are closed and resealed, warning signs are placed on all of these doors or openings. Refer to placarding instructions for sign requirements.

i. Trucks, vans, chambers, containers and other transport vehicles to be placed aboard vessels or on piggyback rail shipments may be fumigated in-transit, but must not be moved while under fumigation over public roads or highways when moved to the rail site or vessel for loading.

5. FUMIGATION IN SMALL SEALABLE ENCLOSURES

a. Determine that the small sealable enclosures can be made relatively gas tight.

b. Place the tablets or pellets in the space to be fumigated. Never pile pellets or tablets on top of each other.

c. Secure the structure in such a way as to prevent gas loss.

d. Post warning signs on all sides of the structure.

e. If the structure is properly sealed, workers need not vacate the premises. However, you must observe proper exposure levels found elsewhere in this manual.

f. Maintain good cross ventilation during working hours.

g. Observe proper exposure procedures.

6. PROCEDURES FOR FUMIGATION OF SPACE IN MILLS, WAREHOUSES AND OTHER STRUCTURES

a. Determine the dosage of tablets or pellets to be applied based upon the following parameters for space fumigation.

   1. The volume of the structure.
   2. The air and/or commodity temperature.
   3. The general tightness of the structure to be fumigated.

b. Carefully seal the area to be fumigated.

c. Place trays or sheets of Kraft paper, up to 12 sq. ft. in area, on the floor of the structure to hold the tablets or pellets.

d. Spread tablets or pellets on the sheets at a density no greater than 30 tablets per sq. ft. or 75 pellets per sq. ft. This corresponds to slightly more than one-half flask of tablets or one-half flask of pellets per 3' x 4' sheet.

e. Check the sheet to see that aluminum phosphide has not been piled up and that it is dispersed evenly to minimize contact between the individual tablets or pellets.

f. Doors leading to the fumigated space are then closed, sealed and locked. Aluminum phosphide warning signs must be placed on all entrances. Refer to the placarding instructions found elsewhere in this manual.

g. The fumigation period usually lasts from 2 to 5 days, depending upon the temperature. Do not fumigate when the temperature of the commodity or the space within the structure is below 40° F (5° C). Consult the label and other labeling for further information.

h. Upon completion of the exposure period, windows and doors should be opened and the fumigated structure allowed to aerate. Gas concentration readings must be taken using low level detector tubes before allowing personnel to re-enter the area. Refer to aeration, reentry and industrial hygiene monitoring sections found elsewhere in this document.

i. Spent residue dust remaining after the fumigation is disposed of as described in disposal procedures found elsewhere in this manual.

7. BARGE FUMIGATION DIRECTIONS

a. Determine barge is suitable for fumigation.

b. Determine barge is dry and clean.

c. Determine that lids and hatch covers are in good order and can be secured.

d. 1. Bulk Commodities can be treated as follows:

-By placing tablets or pellets into the stream as the commodity is being loaded on the barge.

-Or, after completion of loading fumigant by using directions for land based structures inserting the pellets and tablets below the surface with probes.

2. Bagged or Other Packaged Commodities can be treated as follows:

-Upon completion of loading, apply tablets or pellets in a manner consistent with other bagged or packaged fumigation directions in land based structures.

e. Close and secure covers.

f. Post appropriate warning signs to include ballast tank openings as well as cargo area.

g. Notify consignee the commodity is under fumigation.

h. Prior to unloading barges make appropriate test to ascertain cargo area as well as ballast areas are free of hydrogen phosphide gas.

NOTE: Barge fumigation is regulated by the U.S. Coast Guard Regulations 46 CFR 147A as modified by U.S. Coast Guard Special Permit 2-75. The shipper or fumigator must possess this permit prior to fumigating. To obtain this permit contact:

U.S. Coast Guard
Hazardous Materials Branch
Washington, D.C. 20593-0001

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8. RAILCAR FUMIGATION

Bulk Raw Commodities and Processed Brewers Rice, Malt and Corn Grits

a. Determine proper dosage and exposure time.

b. Seal any vents, cracks or other leaks.

c. For raw agricultural commodities aluminum phosphide may be added directly to the commodity as it is loaded, or probed in after loading is completed. Probing is easily done by using a 5' x 7' section of rigid PVC tubing that is 1-1/4" in diameter. Tablets or pellets are dropped through the tube as it is withdrawn from the commodity.

d. All doors and hatch covers are then sealed with tape to prevent gas loss.

e. After the doors or hatch covers are closed and sealed, warning signs are placed on the top and sides of the car as required by law. Refer to placarding instructions for sign requirements.

f. Notify the consignee that the railcar has been fumigated.

Processed Food

a. Volume of space is first determined.

b. Determine proper dosage and exposure time.

c. Seal any vents, cracks or other leaks.

d. The fumigation of processed food in railcars must be done in such a manner as to prevent contact of aluminum phosphide or its residual dust with the commodity or its packaging.

e. Tablets or pellets may be placed in moisture permeable material and then fastened to substantial supports in order to prevent contamination during rail car movement.

f. All doors and hatch covers are then sealed with tape to prevent gas loss.

g. After the doors or hatch covers are closed and sealed, warning signs are placed on the top and sides of the car as required by law. Refer to placarding instructions for sign requirements.

h. Notify the consignee that the railcar has been fumigated.

Treatment of Beehives, Supers and other Beekeeping Equipment

FUMITOXIN tablets and pellets may be used for the control of the greater wax moth in stored beehives, supers and other beekeeping equipment and for the destruction of bees, Africanized bees, and diseased bees including those infested with tracheal mites and foulbrood. The recommended dosage for this use is 30-45 tablets or 150-225 pellets per 1,000 cubic feet.

Fumigations may be performed in chambers at atmospheric pressure, under tarpaulins, etc., by placing the tablets or pellets on trays or in moisture permeable envelopes. Do not add more than 2 tablets or 10 pellets to each envelope. Honey from treated hives or supers may only be used for bee food.

FUMI-SLEEVE DUST RETAINER METHOD OF FUMIGATION

The presence of residue from FUMITOXIN tablets or pellets in treated raw agricultural commodities normally presents no problems of toxicity or sanitation. Nevertheless, where it is specified no tablets or pellets can be placed directly into the commodity during fumigation, conduct the fumigation in the normal manner following the directions below:

1. Determine the structure can be made relatively tight by sealing all vents, windows, cracks or other openings.

2. Determine the dosage and appropriate number of probings to be used.

3. The FUMI-SLEEVE Dust Retainer is slipped over the standard 1-1/4" PVC probe.

4. The probe with Dust Retainer is then inserted into the commodity.

5. As the probe is withdrawn, leaving the Dust Retainer in the commodity the appropriate number of tablets or pellets are poured into the probe.

6. After the probe is completely removed, leaving the Dust Retainer containing the tablets or pellets in the commodity, tie off the top of the Retainer in a common overhand knot.

7. Post the structure (ship hold, barge, container on the ship, railcar, other piggyback structure) with appropriate warning signs as well as a sign showing the number of FUMI-SLEEVE Dust Retainers used.

8. On completion of fumigation remove all Retainers from the treated commodity and transport in a well ventilated container to disposal site.

9. Disposal

   a. Complete Dust Retainer and residue can be buried.

   b. Although it is not recommended, if the FUMI-SLEEVE Dust Retainer is to be used again, it should be opened, the residue emptied out and buried. The empty Dust Retainer should be washed and completely dried before re-use.

Rodent Burrow

Use of this product in the listed areas is prohibited without first contacting and obtaining permission from the Endangered Species Specialist in the regional offices of the U.S. Fish and Wildlife Services (FWS) nearest you.

1. Read container label, training booklet, as well as other supplemental labeling.
2. Locate listed pest burrow.
3. Assess the moisture content of the soil.
4. Add tablets or pellets according to label directions. (Use lower rates in smaller burrows, or when moist soil conditions exist, and higher rates in larger burrows or when soil moisture is low.)
5. Pack burrow openings with crumpled newspaper.
6. Seal tightly by shoveling soil over the openings.
7. Check burrows in one or two days and treat re-opened burrows.
8. Do not use within 15 feet of inhabited structure.
9. Do not apply to burrows which may open under or into occupied buildings.
10. Respiratory equipment is not required to be on hand for outside burrow fumigation.

Placarding of Fumigated Areas

The applicator must placard or post all entrances to the fumigated area with signs bearing:

1. The signal word DANGER/PELIGRO and the SKULL AND CROSSBONES symbol in red.

2. The statement, "Area and/or commodity under fumigation, DO NOT ENTER/NO ENTRE."

3. The statement, "This sign may only be removed after the commodity and/or area is completely aerated (contains 0.3 ppm or less phosphine gas). If incompletely aerated commodity is transferred to a new site, the new site must also be placarded, and workers must not be exposed to more than 0.3 ppm phosphine."

4. The date and time fumigation begins and is completed.

5. Name of fumigant used.

6. Name, address, and telephone number of the applicator.

All entrances to a fumigated area must be placarded. Where possible, placards should be placed in advance of the fumigation in order to keep unauthorized persons away. For railroad hopper cars, placarding must be placed securely on both sides of the car near the ladders and next to the top hatch into which the fumigant is introduced.

Do not remove a placard until the treated ~~area~~ commodity is aerated down to 0.3 ppm or less. To determine whether aeration is complete, each fumigated site or vehicle must be monitored following directions found under Industrial Hygiene Monitoring and shown to contain 0.3 ppm or less phosphine gas in the air space around and, when feasible, in the mass of the commodity. Transfer of incompletely aerated commodity to a new site is permissible, however, the new storage site must be placarded if more than 0.3 ppm is detected. Workers who handle incompletely aerated commodity must be informed and appropriate measures taken (i.e. ventilation or respiratory protection) to prevent exposures from exceeding the TLV's for hydrogen phosphide.

It is recommended that the person responsible for removing placards be familiar with the physical chemical and toxicological properties of hydrogen phosphide. They should also be knowledgeable in how to take gas readings, exposure limits, symptoms and first aid treatment for hydrogen phosphide poisoning.

AERATION OF FUMIGATED COMMODITIES

Foods and Feeds

Tolerances for hydrogen phosphide residues have been established at 0.1 ppm for animal feeds and 0.01 ppm for finished foods. To guarantee compliance with these tolerances, it is necessary to aerate these commodities for 48 hours prior to offering them to the end consumer.

Tobacco

Tobacco must be aerated for at least three days (72 hours) when fumigated in hogsheads or until concentration is below .3 ppm and for at least two days (48 hours) when fumigated in other containers. When plastic liners are used, longer aeration periods will probably be required to aerate the commodity down to 0.3 ppm.

As an alternative to these aeration periods, each container of a treated commodity may be analyzed for residue using accepted analytical methods. If residues are less than tolerance levels, the commodity may be shipped to the consumer regardless of the above holding periods.

DISPOSAL INSTRUCTIONS

General

The EPA has determined that proper disposal of aluminum phosphide will cause no unreasonable adverse effects to the environment. Contact your State Pesticide or Environmental Control Agency, or Hazardous Waste representative at the nearest EPA Regional Office for guidance.

1. Do not contaminate water, food or feed by disposal of pesticide wastes.

2. Unreacted or partially reacted FUMITOXIN is acutely hazardous. Improper disposal of excess pesticide, spray mixture, 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. For specific instructions, refer to wet deactivation method of disposal and spill and leak procedures, or call your Pestcon Systems, Inc. representative for guidance.

3. Some local and state waste disposal regulations may vary from the following recommendations. Disposal procedures should be reviewed with appropriate authorities to insure compliance with local regulations. Contact your State Pesticide or Environmental Control Agency or Hazardous Waste Specialist at the nearest EPA Regional Office for guidance.

4. Triple rinse flasks and stoppers with water. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities. Rinsate may be disposed of in a sanitary landfill or by other approved procedures. Or, it is permissible to remove lids and expose empty flasks to atmospheric conditions until residue in the flasks is reacted. Then puncture and dispose of in a sanitary landfill or other approved site, or by other procedures approved by state and local authorities.

5. If properly exposed, the residual dust remaining after a fumigation with FUMITOXIN will be a grayish-white powder and contain a small amount of unreacted aluminum phosphide. THE RESIDUAL DUST FROM INCOMPLETELY EXPOSED FUMITOXIN WILL REQUIRE SPECIAL CARE.

DIRECTIONS FOR DISPOSAL OF SPENT RESIDUAL DUST

1. In open areas, small (not more than 5 flasks) amounts of residual dust may be disposed of on site by burial or by spreading over the land surface away from inhabited buildings.

2. Residual dust from FUMITOXIN may also be collected and disposed of at a sanitary landfill, incinerator or other approved sites by other procedures approved by Federal, State or Local authorities.

3. From 2 to 3 kg (4 to 7 lbs.) of residual dust from 2 to 3 flasks of FUMITOXIN may be collected for disposal in a 1-gallon bucket. Larger amounts, up to one-half case, may be collected in burlap, cotton or other types of porous cloth bags for transportation in an open vehicle to the disposal site. Do not collect dust from more than 7 flasks of tablets or 10 flasks of pellets (about 11 kg or 25 lbs.) in a single bag. DO NOT PILE BAGS TOGETHER. DO NOT USE THIS METHOD FOR PARTIALLY SPENT OR "GREEN" DUST. CAUTION: DO NOT COLLECT DUST IN LARGE DRUMS, DUMPSTERS, PLASTIC BAGS OR OTHER CONTAINERS WHERE CONFINEMENT MAY OCCUR.

DIRECTIONS FOR DEACTIVATION AND DISPOSAL OF "GREEN" PARTIALLY SPENT RESIDUAL DUST.

Confinement of partially spent residual dust, as in a closed container, or collection and storage of large quantities of dust may result in a fire hazard. Small amounts of hydrogen phosphide may be given off from traces of unreacted aluminum phosphide, and confinement of the gas may result in a flash. Prior to disposal when it is necessary to further deactivate partially spent residue following an incomplete exposure time or following a fumigation which has produced large quantities of partially spent material, ~~we recommend~~ you must use the wet method described below.

A. DIRECTIONS FOR WET METHOD DEACTIVATION AND DISPOSAL OF LARGE QUANTITIES (OVER 5 FLASKS) OF PARTIALLY SPENT OR "GREEN" DUST.

1. Deactivating solution is prepared by adding the appropriate amount of low sudsing liquid detergent or surfactant to water in a drum or other suitable container. A 2% solution of detergent (4 cups to 30 gallons) is suggested. The container should be filled with deactivating solution to within a few inches of the top.

2. Residual dust is poured slowly into the deactivating solution and stirred so as to thoroughly wet all of the residual dust. This must be done in the outdoor air and not the fumigated structure. Dust from FUMITOXIN tablets or pellets should be mixed in no less than 10 gallons of water-detergent solution for each case of material used.

3. Dispose of the deactivated residue-water suspension, with or without preliminary decanting, at a sanitary landfill or other suitable site approved by local authorities. Where permissible, the slurry may be poured into a storm sewer (if you have allowed this mixture to stand for no less than 36 hours), or out onto the ground.

4. CAUTION: Wear appropriate respiratory protection during wet deactivation of partially spent material. Do not cover the container holding the slurry at any time. Do not dispose of residual dust in a toilet. Do not allow quantities of dry, residual dust from FUMITOXIN to be collected or stored.

B. DIRECTIONS FOR DRY METHOD DEACTIVATION AND DISPOSAL OF SMALL, NOT MORE THAN 5, FLASKS OF PARTIALLY SPENT DUST:

1. Smaller amounts, not more than 5 flasks, of partially spent dust may be spread in an open area away from inhabited buildings and restricted from access to by humans or animals and allowed to be further deactivated by atmospheric exposure. This dust may then be buried or transported to appropriate sites and disposed of as directed in "Directions for disposal of spent dust" No. 2, page _____ of this manual.

SPILL AND LEAK PROCEDURE

A spill, other than incidental to application or normal handling may produce high levels of gas and, therefore, attending personnel must wear SCBA when the concentration of hydrogen phosphide gas is unknown. Other NIOSH/MSHA approved respiratory protection may be worn if the concentration is known. Do not use water at any time to clean up a spill of FUMITOXIN. Water in contact with unreacted tablets, pellets or bags will greatly accelerate the production of hydrogen phosphide gas which could result in a toxic and/or fire hazard. Wear gloves of cotton or other suitable material when handling aluminum phosphide.

A. Return all intact aluminum flasks to cardboard cases or other suitable packaging which has been properly marked according to DOT regulations. Notify consignee and shipper of damaged cases.

B. If aluminum flasks have been punctured or damaged so as to leak, the container may be temporarily repaired with aluminum tape or the FUMITOXIN may be transferred from the damaged flask to a sound metal container which should be sealed and properly labeled as aluminum phosphide. Transport the damaged containers to an area suitable for pesticide storage for inspection. Contact Pestcon Systems, Inc. for further instructions.

C. If a spill has occurred which is only a few minutes old, collect the tablets and pellets and place them back into the original flasks, if they are intact, and stopper tightly. Place the tablets and pellets in a sound metal container if the original flasks are damaged. CAUTION: These flasks may flash upon opening at a later date.

D. If the age of the spill is unknown or if the tablets or pellets have been contaminated with soil, debris, water, etc., gather up the spillage and place it into small open buckets having a capacity no larger than about 1 gallon. Do not add more than one flask of spillage material, 1 to 1.5 kg (2 to 3 lbs.) to the bucket. If on-site, wet deactivation is not feasible, these open containers should be transported in open vehicles to a suitable area. Wet deactivation may be carried out as described away from inhabited buildings. Alternatively, small amounts of spillage from 4 to 5 flasks (4 to 8 kg, 9 to 18 lbs.) may be spread out in an open area to be deactivated by atmospheric moisture.

E. Procedure for wet deactivation of spills:

1. Deactivating solution is prepared by adding the appropriate amount of low sudsing liquid detergent or surfactant to water in a drum or other suitable container. A 2% solution or 4 cups in 30 gallons is recommended. The container should be filled with deactivating solution to within a few inches of the top.

2. The tablets or pellets are poured slowly into the deactivating solution and stirred so as to thoroughly wet all of the FUMITOXIN. This must be done in the open air. FUMITOXIN tablets or pellets should be mixed into no less than about 15 gallons of water-detergent solution for each case of spilled material.

3. Allow the mixture to stand, with occasional stirring, for at least 36 hours.

4. Dispose of the slurry of deactivated material, with or without preliminary decanting, at a sanitary landfill or other suitable site approved by local authorities. Where permissible, this slurry may be poured out onto the ground or into a storm sewer.

CAUTION: Wear appropriate respiratory protection during wet deactivation of unexposed FUMITOXIN. Never place pellets, tablets, or dust in a closed container such as a dumpster, sealed drum, plastic bag, etc., as flammable concentrations can develop and a flash of hydrogen phosphide gas is likely to occur. THE EPA HAS DETERMINED THAT PROPER DISPOSAL OF ALUMINUM PHOSPHIDE WILL CAUSE NO UNREASONABLE ADVERSE EFFECTS TO THE ENVIRONMENT.

FOR ASSISTANCE CONTACT:

PESTCON SYSTEMS, INC.

P.O. BOX 469

ALHAMBRA, CALIFORNIA 91802

TELEPHONE: (213) 283-2761

TELEX: 698635

OR

CHEMTREC (800) 424-9300

WE RECOMMEND THAT YOU GIVE YOUR COMPANY PHYSICIAN AND/OR THE EMERGENCY CENTER CLOSEST TO THE JOB SITE A COPY OF THIS PAGE:

Note to Physician:

Aluminum phosphide in tablets, pellets and bags react with moisture from the air, water, acids and many other liquids to release hydrogen phosphide (phosphine) gas. Mild exposure to inhalation causes malaise (indefinite feeling of sickness), ringing of ears, fatigue, nausea, and pressure in the chest which is relieved by removal to fresh air. Moderate poisoning causes weakness, vomiting, pain just above the stomach, chest pain, diarrhea and dyspnea (difficulty in breathing). Symptoms of severe poisoning may occur within a few hours to several days, resulting in pulmonary edema (fluid in lungs) and may lead to dizziness, cyanosis (blue or purple skin color), unconsciousness, and death.

In sufficient quantity, phosphine affects the liver, kidneys, lungs, nervous system, and circulatory system. Inhalation can cause lung edema (fluid in lungs) and hyperemia (fluid in brain). Ingestion can cause lung and brain symptoms but damage to the viscera (body cavity organs) is more common. Phosphine poisoning may result in (1) pulmonary edema, (2) liver elevated serum GOT, LDH and alkaline phosphatase, reduced prothrombin, hemmorhage and jaundice (yellow skin color) and (3) kidney hematuria (blood in urine) and anuria (abnormal lack of urination). Pathology is characteristic of hypoxia (oxygen deficiency in body tissue). Frequent exposure to subacute concentations over a period of days or weeks may cause poisoning. Treatment is symptomatic.

The following measures are suggested for use by the physicians in accordance with their own judgement:

In its milder forms, symptoms of poisoning may take some time (up to 24 hours) to make their appearance, and the following is suggested:

1. Give complete rest for 1 - 2 days, during which the patient must be kept quiet and warm.

2. Should patient suffer from vomiting or increased blood sugar, appropriate solutions should be administered. Treatment with oxygen breathing equipment is recommended as is the administration of cardiac and circulatory stimulants.

In case of severe poisoning (intensive care unit recommended):

1. Where pulmonary edema is observed, steroid therapy should be considered and close medical supervision is recommended. Blood transfusions may be necessary.

2. In case of manifest pulmonary edema, venesection should be performed under vein pressure control. Heart Glycosides (I.V.)(in case of hemoconcentration, venesection may result in shock). On progressive edema of lungs immediate intubation with a constant removal of edema fluid and oxygen over-pressure respiration, as well as any measures required for shock treatment. In case of kidney failure, extra-corporeal hemodialysis is necessary. There is no specific antidote known for this poisoning.

3. Mention should be made here of suicidal attempts by taking solid phosphine by the mouth. After swallowing, emptying of the stomach by vomiting, flushing of the stomach with diluted potassium permanganate solution or a solution of magnesium peroxide until flushing liquid ceases to smell of carbide. Thereafter, apply carbomedicinalis.