



**U.S. ENVIRONMENTAL PROTECTION AGENCY**  
 Office of Pesticide Programs  
 Registration Division (7505P)  
 1200 Pennsylvania Ave., N.W.  
 Washington, D.C. 20460

EPA Reg. Number:  
 19713-570

Date of Issuance:  
 JUN 17 2010

Terms of Issuance:  
 Unconditional

Name of Pesticide Product:  
**DREXEL DREX-PH3**  
**Aluminum Phosphide**  
**Fumigant Bags**

NOTICE OF PESTICIDE:  
 \_\_\_ Registration  
XX Reregistration  
 (under FIFRA, as amended)

Name and Address of Registrant (include ZIP Code):  
 Drexel Chemical Company  
 P.O. Box 13327  
 Memphis, TN 38113-0327

**Note:** Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above EPA registration number.

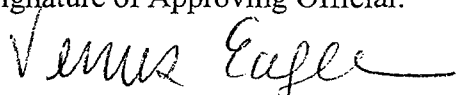
On the basis of information furnished by the registrant, the above named pesticide is hereby reregistered under the Federal Insecticide, Fungicide and Rodenticide Act. Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

Based on your response to the Reregistration Eligibility Document, EPA has reregistered the product listed above. This action is taken under the authority of section 4(g)(2)(c) of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended. Reregistration under this section does not eliminate the need for continual reassessment of pesticides. EPA may require submission of data at any time to maintain the registration of your product. Within 45 days from the date of this notice, two copies of a final printed label must be submitted with the following change:

- Revise "Gloves are not required to handle intact bags. However, wear dry gloves of cotton or other materials if contact with active or spent material from the bags is likely" to read "Wear dry gloves of cotton or other materials if contact with active or spent material from the bags is likely."
- In the Applicator's Manual, replace "APPLICATOR'S MANUAL & COMPLETE LABEL FOR..." with "APPLICATOR'S MANUAL".

Your Confidential Statement of Formula (CSF) dated June 6, 2002 is acceptable. This CSF supercedes all previous CSFs.

A copy of the stamped label is enclosed for your records.

Signature of Approving Official:  
  
 Venus Eagle, Product Manager 1  
 Registration Division, Insecticide-Rodenticide Branch

Date:  
 JUN 17 2010

2/16

# RESTRICTED USE PESTICIDE

(Due To High Acute Inhalation Toxicity Of Phosphine Gas)

FOR RETAIL SALE TO DEALERS AND CERTIFIED APPLICATORS ONLY. FOR USE BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION, AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION. REFER TO THE DIRECTIONS IN THIS APPLICATOR MANUAL FOR REQUIREMENTS OF THE PHYSICAL PRESENCE OF A CERTIFIED APPLICATOR.

THE COMPLETE LABEL FOR THIS PRODUCT CONSISTS OF THE CONTAINER LABEL AND THE APPLICATOR'S MANUAL WHICH MUST ACCOMPANY THE PRODUCT. READ AND REVIEW THE ENTIRE LABEL WHICH INCLUDES THE CONTAINER LABEL AND APPLICATOR'S MANUAL.

A FUMIGATION MANAGEMENT PLAN MUST BE WRITTEN FOR ALL FUMIGATIONS PRIOR TO ACTUAL TREATMENT. CONSULT WITH YOUR STATE LEAD PESTICIDE REGULATORY AGENCY TO DETERMINE REGULATORY STATUS, REQUIREMENTS, AND RESTRICTIONS FOR FUMIGATION USE IN THAT STATE. CALL (901) 774-4370 IF YOU HAVE ANY QUESTIONS OR DO NOT UNDERSTAND ANY PART OF THIS LABELING.

**ACCEPTED  
With COMMENTS  
In EPA Letter Dated:  
JUN 17 2010**

**Under the Federal Insecticide, Fungicide  
and Rodenticide Act, As amended, for the  
pesticide Registered under EPA Reg. No:**

**19713-570**



# Drex-PH<sub>3</sub><sup>®</sup>

Aluminum Phosphide Fumigant Bags

A fumigant for use against insects which infest stored commodities.

**ACTIVE INGREDIENT:**

Aluminum Phosphide ..... 60.0%

**OTHER INGREDIENTS:** ..... 40.0%

**TOTAL:** ..... 100.0%

**KEEP OUT OF REACH OF CHILDREN  
DANGER  PELIGRO  
POISON  VENENO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

**See FIRST AID Below**

**EPA Reg. No. 19713-570**

**EPA Est. No. \_\_\_\_\_**

**Content: 100 Bags  
Net Weight: 6.88 lbs. (3.12 kg)**

FIRST AID	
<b>IF INHALED:</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or ambulance, begin artificial respiration immediately, preferably mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
<b>IF SWALLOWED:</b>	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious or convulsing person.</li> </ul>
<b>(Continued)</b>	

FIRST AID (Cont.)	
<b>IF ON SKIN OR CLOTHING:</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15 to 20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>IF IN EYES:</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<p>Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For information on this pesticide product (including health concerns, medical emergencies or pesticide incidents), call the National Pesticide Information Center at 1-800-858-7378.</p> <p>Symptoms of overexposure to this product 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. Direct the emergency personnel to the First Aid section.</p> <p><b>NOTE TO PHYSICIAN</b></p> <p>Aluminum phosphide fumigants react with moisture from the air, water, acids and many other liquids, to release phosphine gas. Mild exposure by inhalation causes malaise (indefinite feeling of sickness), ringing in the ears, fatigue, nausea and pressure in the chest, which is relieved by removal to fresh air. Moderate poisoning causes weakness, vomiting, and pain just above the stomach, chest pain, diarrhea and dyspnea (difficulty in breathing). Symptoms of severe poisoning may occur with 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 (excess of blood in body parts), small perivascular brain hemorrhages 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</p>	
<b>(Continued)</b>	

Drex-PH<sub>3</sub> and the Drexel logo are registered trademarks of Drexel Chemical Company.

GOT, LDH, and alkaline phosphates, reduced prothrombin, hemorrhage, and jaundice (yellow skin color) and (3) kidney hematuria (blood in urine) and anuria (abnormal or lack of urination). Pathology is characteristic of hypoxia (oxygen deficiency in body tissue). Frequent exposure to concentration above permissible levels over a period of days or weeks may cause poisoning. Treatment is symptomatic.

The following measures are suggested for use by the physician in accordance with his own judgement: In its milder form, 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 to 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 cases of severe poisoning (Intensive Care Unit is 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 haemoconcentration, venesection may result in shock). On progressive edema of the lungs: Immediate intubations 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 the poisoning.
3. Mention should be made here of suicidal attempts by taking solid Aluminum phosphide by mouth. After swallowing: emptying of the stomach by vomiting, flushing of the stomach with diluted potassium permanganate solution of magnesium peroxide until flushing ceases to smell of carbide. Thereafter, apply carbomedicinals.

#### HOT LINE NUMBER

Have the product container, label, or applicator's manual with you when calling a poison control center or doctor, or going for treatment. **CONTACT 1-800-858-7378 FOR ASSISTANCE WITH HUMAN OR ANIMAL MEDICAL EMERGENCIES:** You may also contact us at Drexel Chemical Company (901) 774-4370.

#### PRECAUTIONARY STATEMENTS Hazards to Humans and Domestic Animals

**DANGER:** Aluminum phosphide dust from this product may 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. If a sealed container is opened, or if the material comes in contact with moisture, water or acids, this product will release phosphine which is an extremely toxic gas. If a garlic odor is detected, refer to the "Industrial Hygiene Monitoring" under the "Applicator and Worker Exposure" section of the Applicator's Manual for appropriate monitoring procedures. Pure phosphine gas is odorless; the garlic odor is due to a contaminant. Since the odor of phosphine may not be detected under some circumstances, the absence of a garlic odor does not mean that dangerous levels of phosphine gas are absent. Observe proper application, aeration, re-entry and disposal procedures specified elsewhere in the labeling to prevent overexposure.

#### ENVIRONMENTAL HAZARDS

This product is very highly toxic to wildlife. Non-target organisms exposed to phosphine gas 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.

#### PHYSICAL AND CHEMICAL HAZARDS

Aluminum Phosphide Bags will release phosphine if exposed to moisture from the air or if it comes in contact with water, acids and many other liquids. Dust from this product may cause a temperature increase and confine the release of gas so that ignition could occur. It is preferable 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 a flash may occur. When opening, point the container away from the face and

body. These precautions will also reduce the applicators exposure to phosphine gas. Pure 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; fork lifts, temperature monitoring systems, electrical switch gears, communication devices, computers, calculators, watches, and other electronic equipment should be protected or removed before fumigation. Phosphine will also react with certain metallic salts and therefore, such items as photographic film, copying paper and some inorganic pigments, etc. should not be exposed.

#### DIRECTIONS FOR USE RESTRICTED USE PESTICIDE

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

This fumigant when applied according to label instructions is activated by atmospheric humidity. Drex-PH<sub>3</sub> has been found effective against many stored products insects and their pre-adult stages - that is eggs, larvae, and pupae. Refer to the Applicator's Manual for directions for use (e.g. pests controlled, specific commodities), precautions and restrictions.

### STORAGE AND DISPOSAL

#### Do not contaminate water, food or feed by storage and disposal. PESTICIDE STORAGE INSTRUCTIONS

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

Do not store in buildings where humans or domestic animals reside. Keep out of reach of children.

The labeling of the storage area should take into account the needs of a variety of organizations. These should include, but not be limited to company policy, insurance carrier, Occupational Safety and Health Administration (OSHA), Emergency Planning and Right to Know and local emergency response professionals. At a minimum, the storage must be marked with the following signs and must be locked:

1. Danger, Poison (with skull and cross bones)
2. Authorized Personnel Only
3. National Fire Protection Association (NFPA) Hazard Identification Symbols

The National Fire Protection Association (NFPA) has developed Hazard Identification Symbols. This standardized system is designed to provide, at a glance the information regarding the health, fire and reactivity hazards associated with hazardous materials.

The following are the hazard categories and degree of hazard for aluminum phosphide:

Category	Degree of Hazard
Health	4 (Severe Hazard)
Flammability	4 (Severe Hazard)
Reactivity	2 (Moderate)
Special Notice Key	W

**Note:** When using the NFPA Hazard Identification System, the characteristics of all hazardous materials stored in a particular area must be considered. The local fire protection district should be consulted for guidance on the selection and placement of such signs.

#### PESTICIDE AND CONTAINER DISPOSAL INSTRUCTIONS

Do not contaminate water, food or feed by storage or disposal. Unreacted or partially reacted form of this product is acutely hazardous.

Improper disposal of excess pesticide is a violation of Federal law. If these wastes cannot be disposed of by use according to the Applicator's Manual 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, see "SPILL AND LEAK PROCEDURES", "DEACTIVATION PROCEDURES" and "DISPOSAL PROCEDURES" sections of the Applicator's Manual.

Some local and state waste disposal regulations may vary from these general recommendations. Disposal procedures should be

(Continued)

## STORAGE AND DISPOSAL (Cont.)

reviewed with appropriate authorities to ensure compliance with local regulations. Contact your state Pesticide or Environmental Control Agency or Hazardous Waste Specialist at the nearest EPA Regional Office for guidance.

### Container Disposal:

The containers are nonrefillable. Do not reuse or refill containers. Offer for recycling, if available. Triple rinse cans, drums or foil pouches with water if they have been contacted with spent or partially reacted dust from bags of this product. They may then be recycled or reconditioned, or punctured and disposed of in a sanitary landfill, or by other procedures approved by state and local authorities. Rinsate may be disposed of in a sanitary landfill by pouring it out onto the ground or by other approved procedures. It is also permissible to remove lids and expose empty flasks to atmospheric conditions until residue is reacted. In this case, puncture and dispose of in a sanitary landfill or other approved site, or by other procedures approved by state and local authorities.

### Residual Dust:

If properly exposed, the residual dust remaining after a fumigation with this product will be a grayish white powder. This will be a non-hazardous waste and contain only a small amount of unreacted aluminum phosphide. However, residual dust from incompletely exposed form of this product, (so called green dust) requires special care.

Do not confine spent or partial spent bags in a closed containers as this may result in a fire hazard. Small amounts of hydrogen phosphide may be given off from the unreacted aluminum phosphide, and confinement of the gas may result in a flash. Unless it can be determined with certainty that the bags are spent, they must be deactivated as described below prior to disposal.

### Disposal of Unreacted or Partially reacted Drex-PH<sub>3</sub> bags: (From spills, leaking containers or other sources)

Unreacted or partially reacted Drex-PH<sub>3</sub> bags are acutely hazardous. Improper disposal of this product is a violation of federal law. If this product cannot be disposed of by ordinary use or according to the instructions that follow, contact your state pesticide or environmental control agency or the hazardous waste representative at the nearest EPA regional office for guidance. Do not contaminate waste by disposal. Some local and state waste disposal regulations may vary from the following recommendations. Disposal procedures should be reviewed with appropriate authorities to ensure compliance with local regulations.

**Caution:** Wear a NIOSH/MSHA approved full-face gas mask – hydrogen phosphide canister combination if exposed to levels between 0.3 ppm to 15 ppm or a Self-Contained Breathing Apparatus (SCBA) if exposure is unknown or above 15 ppm must be worn during wet deactivation of partially spent material. Do not cover the container being used for wet deactivation.

Do not dispose of dust from bags of this product in a toilet.

## SPILL AND LEAK PROCEDURES

For specific instructions, see "SPILL AND LEAK PROCEDURES" section of the Applicator's Manual.

## DEACTIVATION PROCEDURES

For specific instructions, see "DEACTIVATION PROCEDURES" section of the Applicator's Manual.

## DISPOSAL PROCEDURES

For specific instructions, see "DISPOSAL PROCEDURES" section of the Applicator's Manual.

## WARRANTY—CONDITIONS OF SALE

OUR DIRECTIONS FOR USE of this product are based upon tests believed reliable. Follow directions carefully. Timing and method of application, weather and crop conditions, mixtures with other chemicals not specifically recommended and other influencing factors in the use of this product are beyond the control of the seller. To the extent consistent with applicable law, Buyer assumes all risks of use, storage and handling of this material not in strict accordance with directions given herewith.

To the extent consistent with applicable law, in no case shall the Manufacturer or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product when such use and/or handling is not in strict accordance with directions given herewith. The foregoing is a condition of sale by the Seller and is accepted as such by the Buyer.

Manufactured For:

**Drexel Chemical Company**

P.O. BOX 13327, MEMPHIS, TN 38113-0327

**SINCE 1972**

# RESTRICTED USE PESTICIDE

(Due To High Acute Inhalation Toxicity Of Phosphine Gas)

FOR RETAIL SALE TO DEALERS AND CERTIFIED APPLICATORS ONLY. FOR USE BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION, AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION. REFER TO THE DIRECTIONS IN THIS APPLICATOR MANUAL FOR REQUIREMENTS OF THE PHYSICAL PRESENCE OF A CERTIFIED APPLICATOR.

## APPLICATOR'S MANUAL AND COMPLETE LABEL FOR

ACCEPTED  
With COMMENTS  
In EPA Letter Dated:  
JUN 17 2010

Under the Federal Insecticide, Fungicide  
and Rodenticide Act, As amended, for the  
pesticide Registered under EPA Reg. No:

19713-570



# Drex-PH<sub>3</sub>®

Bags

For use against listed insects which infest stored Commodities.

**ACTIVE INGREDIENT:**

Aluminum Phosphide ..... 60.0%

**OTHER INGREDIENTS:** ..... 40.0%

**TOTAL:** ..... 100.0%

**KEEP OUT OF REACH OF CHILDREN**  
**DANGER**  **PELIGRO**  
**POISON**  **VENENO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See **FIRST AID** Below

EPA Reg. No. 19713-570

The complete label for this product consists of the container label and the Applicator's Manual which must accompany the product. Read and review the entire label which includes the container label and Applicator's Manual.

A fumigation management plan must be written for all fumigations prior to actual treatment.

Consult with your State Lead Pesticide Regulatory Agency to determine regulatory status, requirements, and restrictions for fumigation use in that state. Call Drexel Chemical Company at (901) 774-4370 if you have any questions or do not understand any part of this labeling.

FIRST AID	
<b>IF INHALED:</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or ambulance; begin artificial respiration immediately, preferably mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
(Continued)	

FIRST AID (Cont.)	
<b>IF SWALLOWED:</b>	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious or convulsing person.</li> </ul>
<b>IF ON SKIN OR CLOTHING:</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15 to 20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>IF IN EYES:</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<p>Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For information on this pesticide product (including health concerns, medical emergencies or pesticide incidents), call the National Pesticide Information Center at 1-800-858-7378. 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. Direct the emergency personnel to the "FIRST AID" section.</p>	
<b>NOTE TO PHYSICIAN</b>	
<p>Aluminum phosphide fumigants react with moisture from the air, water, acids and many other liquids to release phosphine gas. Mild exposure by inhalation causes malaise (indefinite feeling of sickness), ringing in the ears, fatigue, nausea and pressure in the chest, which is relieved by removal to fresh air. Moderate poisoning causes weakness, vomiting, and 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</p>	
(Continued)	

Drex-PH<sub>3</sub> and the Drexel logo are registered trademarks of Drexel Chemical Company.

## FIRST AID (Cont.)

edema (fluid in lungs) and hyperemia (excess of blood in body parts), small perivascular brain hemorrhages 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 phosphates, reduced prothrombin, hemorrhage, and jaundice (yellow skin color) and (3) kidney hematuria (blood in urine) and anuria (abnormal or lack of urination). Pathology is characteristic of hypoxia (oxygen deficiency in body tissue). Frequent exposure to concentration above permissible levels over a period of days or weeks may cause poisoning. Treatment is symptomatic. The following measures are suggested for use by the physician in accordance with his own judgement: In its milder form, 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 to 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 cases of severe poisoning (Intensive Care Unit is 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 the lungs: Immediate intubations 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 the poisoning.
3. Mention should be made here of suicidal attempts by taking solid Aluminum phosphide by mouth. After swallowing: emptying of the stomach by vomiting, flushing of the stomach with diluted potassium permanganate solution of magnesium peroxide until flushing ceases to smell of carbide is recommended. Thereafter, apply medicinal charcoal.

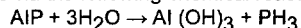
## HOT LINE NUMBER

Have the product container, label, or applicator's manual with you when calling a poison control center or doctor, or going for treatment. CONTACT 1-800-858-7378 FOR ASSISTANCE WITH HUMAN OR ANIMAL MEDICAL EMERGENCIES. You may also contact us at (901) 774-4370.

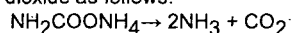
## INTRODUCTION

This product is used to protect stored commodities from damage by the listed pests. In limited areas, applications of this product may be made to control burrowing vertebrate pests. Fumigation of stored products with this product in the manner prescribed in the labeling does not contaminate the marketed commodity.

This product and other metal phosphide fumigants are acted upon by atmospheric moisture to produce phosphine gas. This product contains aluminum phosphide (AIP) as its active ingredient and will liberate phosphine gas via the following chemical reaction:



Phosphine gas is highly toxic to insects, burrowing pests, humans, and other forms of animal life. In addition to its toxic properties, the gas will corrode certain metals and may ignite spontaneously in air at concentrations above its lower flammable limit of 1.8% (v/v). These hazards will be described in greater detail later on in this Applicator's Manual. This product also contains ammonium carbamate, which liberates ammonia and carbon dioxide as follows:



These gases are essentially nonflammable and act as inerting agents to reduce fire hazards.

This product is packaged in tins of 6, 10, or 100 bags each and in drums of foil pouches of 3, 6, and 10 bags per pouch for a total of 300 bags per drum. Each bag is approximately 3 inches by 3 inches and contains 31.2 grams of 60% aluminum phosphide. Bags release approximately 11 grams of phosphide gas when exposed to atmospheric conditions.

Upon exposure to air, this product begins to react with atmospheric

moisture to produce small quantities of phosphine gas. This reaction starts slowly, gradually accelerates and then tapers off again as the aluminum phosphide is spent. This product reacts somewhat faster than do the pellets and tablets. The rates of decomposition will vary depending upon moisture and temperature conditions. For example, when moisture and temperature of the fumigated commodity are high, decomposition of this product may be complete in less than 3 days. However, at lower ambient temperatures and relative humidity levels, decomposition of this product may require 5 days or more. The spent bags must be retrieved for disposal after space fumigations. If properly exposed, the spent form of this product will normally contain only a small amount of unreacted aluminum phosphide and may be disposed of without hazard. While spent form of this product is not considered a hazardous waste, partially spent residual dust from this product incompletely exposed will require special care. Precautions and instructions for further deactivation and disposal will be given later in this label.

This product supplied in tins is non-resealable and must be completely used when opened. This product that is supplied in metal drums does not have to be completely used as long as the bag is not removed from the foil pouch or the foil pouch is not opened. Remove the number of pouches required and reseal the metal drum. The paper bag should never be torn open during the fumigation. Once the hermetically sealed tin or the foil packaging is opened, the bags will begin to release phosphine gas.

## PRECAUTIONARY STATEMENTS

### Hazards to Humans and Domestic Animals

**DANGER:** Aluminum phosphide dust from this product may 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.

If a sealed container is opened, or if the material comes in contact with moisture, water or acids, these products will release phosphine which is an extremely toxic gas. If a garlic odor is detected, refer to the "INDUSTRIAL HYGIENE MONITORING" under the "APPLICATOR AND WORKER EXPOSURE" section of this label for appropriate monitoring procedures. Pure phosphine gas is odorless; the garlic odor is due to a contaminant. Since the odor of phosphine may not be detected under some circumstances, the absence of a garlic odor does not mean that dangerous levels of phosphine gas are absent. Observe proper application, aeration, re-entry and disposal procedures specified elsewhere in the labeling to prevent overexposure.

## ENVIRONMENTAL HAZARDS

This product is very highly toxic to wildlife. Non-target organisms exposed to phosphine gas 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.

## PHYSICAL AND CHEMICAL HAZARDS

Aluminum Phosphide Bags will release phosphine if exposed to moisture from the air or if it comes in contact with water, acids and many other liquids. Since phosphine may ignite spontaneously at levels above its lower flammable limit of 1.8% v/v, it is important not to exceed this concentration. Ignition of high concentrations of phosphine gas can produce a very energetic reaction. Explosion can occur under these conditions and may cause severe personal injury. **Never allow the buildup of phosphine to exceed explosive concentrations.** Do not confine spent or partially spent aluminum phosphide fumigants as the slow release of phosphine from this material may result in formation of an explosive atmosphere. Aluminum phosphide fumigants should not be stacked or piled up or contacted with liquid water. This may cause a temperature increase, accelerate the rate of gas production and confine the gas so that ignition could occur. It is preferable to open containers of aluminum phosphide products in open air as under certain conditions, they may flash upon opening. Containers may also be opened near a fan or other appropriate ventilation that will rapidly exhaust contaminated air. When opening, point the container away from the face and body and remove the lid. Although the chances for a flash are very remote, never open these containers in a flammable atmosphere. These precautions will also reduce the fumigator's exposure to phosphine gas. If containers are opened inside the structure to be fumigated, air monitoring must be conducted to ensure worker's exposure to phosphine gas does not exceed the allowable limit of 8-hour Time Weighted Average (TWA) of 0.3 ppm or the 15-minute Short-Term Exposure Limit (STEL) of 1.0 ppm phosphine.

Pure phosphine gas is practically insoluble in water, fats and oils, and is stable at normal fumigation temperatures. However, it may react  
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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. Thus, small electric motors, smoke detectors, brass sprinkler heads, batteries and battery chargers, fork lifts, temperature monitoring systems, switching gears, communication devices, computers, calculators and other electrical equipment should be protected or removed before fumigation. Phosphine gas will also react with certain metallic salts and therefore, sensitive items such as photographic film, some inorganic pigments, etc. should not be exposed. Immediately after addition of this product to the structure, turn off any lights and unessential electrical equipment.

This product is a Restricted Use Pesticide due to the high acute inhalation toxicity of phosphine gas.

Read and follow the complete label which contains instructions for the safe use of this product. Additional copies are available from: Drexel Chemical Company, P.O. Box 13327, Memphis, TN 38113.

**DIRECTIONS FOR USE**

**RESTRICTED USE PESTICIDE**

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

**PEST CONTROLLED**

This product has been found effective against the following insects and their pre-adult stages – that is eggs, larvae, and pupae.

INSECTS		
Almond moth	European grain moth	Pea weevil
Angoumois grain moth	Flat grain beetle	Pink bollworm
Bean weevil	Fruit flies	Raisin moth
Bees	Granary weevil	Red flour beetle
Cadelle	Greater wax moth	Rice weevil
Cereal leaf beetle	Hairy fungus beetle	Rusty grain weevil
Cigarette beetle	Hessian fly	Saw-toothed grain beetle
Confused flour beetle	Indian meal moth	Spider beetles
Dermestid beetles	Khapra beetle	Tobacco moth
Dried fruit beetle	Lesser grain borer	Yellow meal worm
Dried fruit moth	Maize weevil	
	Mediterranean flour moth	

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 100% control are leaks, poor gas distribution, unfavorable exposure conditions, etc. In addition, some insects are less susceptible to phosphine than others. If maximum control is to be attained, extreme care must be taken in sealing, higher dosages must be used, exposure periods must be lengthened, proper application procedures followed, and temperature and humidity must be favorable.

**COMMODITIES WHICH MAY BE FUMIGATED WITH THIS PRODUCT**

This product may be used for the fumigation of listed raw agricultural commodities, animal feed and feed ingredients, processed foods, tobacco, and certain other non-food items when their commodity temperature is above 40°F (5°C).

**Raw Agricultural Commodities, Animal Feed and Feed Ingredients**

Tablets and Pellets of this product may be added directly to animal feed, feed ingredients and raw agricultural commodities stored in bulk. For these commodities not stored in bulk, this product may be placed in moisture permeable envelopes, on trays and fumigated as with processed foods.

RAW AGRICULTURAL COMMODITIES, ANIMAL FEED AND FEED INGREDIENTS WHICH MAY BE FUMIGATED WITH THIS PRODUCT		
Almonds	Filberts	Safflower seed
Animal feed and feed ingredients	Flower seed	Seed & Pod vegetables
Barley	Grass seed	Sesame seeds
Brazil nuts	Millet	Sorghum
Cashews	Oats	Soybeans
Cocoa beans	Peanuts	Sunflower seeds
Coffee beans	Peanuts	Triticale
Corn	Peanuts	Vegetable seed
Cottonseed	Peanuts	Walnuts
Dates	Rice	Wheat
	Rye	

**Processed Foods**

Processed foods may be fumigated with this product. Under no condition shall any processed food or bagged commodity come in contact with this product or residual dust of this product except that this product may be added directly to processed Brewer's rice, Malt and Corn grits for use in the manufacture of beer.

**Processed Foods Which May Be Fumigated with This Product**

- 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 (such as 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 and figs
- Dried eggs and egg yolk solids
- Dried milk, dried powdered milk, non-dairy creamers, and nonfat dried milk
- Dried or dehydrated fruits (such as apples, citrus, dates, figs, peaches, pears, prunes, raisins and sultanas)
- Processed herbs, spices, seasonings and condiments
- Malt
- Processed nuts (such as almond, apricot kernels, Brazil nuts, cashews, filberts, macadamia nuts, peanuts, pecans, pistachio nuts, walnuts and other processed nuts)
- Processed oats (including oatmeal)
- Rice (brewer's rice, grits, enriched and polished)
- Processed tea
- Dried and dehydrated vegetables (such as beans, carrots, lentils, peas, potato flour, potato products and spinach)
- Yeast (including primary yeast)
- Soybean flour and milled fractions
- Wild rice
- Other processed foods

**Non-food Commodities, Including Tobacco**

The listed non-food items may be fumigated with this product. Tobacco and certain other of the non-food commodities should not be contacted by this product or dust from this product.

**Non-food Commodities Which May Be Fumigated With This Product**

- Processed or unprocessed cotton, wool and other natural fibers of cloth
- Clothing
- Straw and hay
- Feathers
- Human hair, rubberized hair, vulcanized hair, mohair
- Leather products, animal hides and furs
- Tobacco
- Wood, cut trees, wood chips and wood and bamboo products
- Paper and paper products
- Dried plants and flowers
- Seeds (such as grass seed, ornamental herbaceous plant seed and vegetable seed)
- Tires (for mosquito control)
- Other non-food commodities

**EXPOSURE CONDITIONS FOR ALL FUMIGATIONS**

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

MINIMUM EXPOSURE PERIODS FOR THIS PRODUCT	
Temperature	Bags
40°F (5°C)	Do not fumigate
41°-53°F (5-12°C)	14 days (336 hours)
54°-59°F (12-15°C)	9 days (216 hours)
60°-68°F (16-20°C)	5 days (120 hours)
Above 68°F (20°C)	3 days (72 hours)

The fumigation must be long enough so as to provide for adequate control of the insect pests that infest the commodity being treated. Additionally, the fumigation period should be long enough to allow for more or less complete reaction of this product with moisture so that little or no unreacted aluminum phosphide remains. This will minimize exposures during further storage and/or processing of the treated bulk commodity as well as reduce hazards during the disposal of partially spent aluminum phosphide products remaining after space fumigations. The proper length of the fumigation period will vary with exposure conditions, since, in general, insects are more difficult to control at lower temperatures and the rate of hydrogen phosphide gas production by this product is lower at lower temperatures and humidities. It should be noted that there is little to be gained by extending the exposure period if the structure to be fumigated has not been carefully sealed or if the distribution of gas is poor and insects are not subjected to lethal concentrations of phosphine. Careful sealing is required to ensure that adequate gas levels are retained and proper application procedures must be followed to provide satisfactory distribution of phosphine gas. Additional application of this product may be needed if phosphine concentrations drop below an effective level. If re-entry into the treated structure is required, follow the requirements for manpower and respiratory protection usage found under "RESPIRATORY PROTECTION" section in this manual. Some structures can only be treated when completely tarped while others cannot be properly sealed by any means and should not be fumigated. Exposure times must be lengthened to allow for penetration of gas throughout the commodity when fumigant is not uniformly added to the commodity mass, for example, by surface application or shallow probing. This is particularly important in the fumigation of bulk commodity contained in large storages. Remember, exposure periods in the table are minimum periods and may not be adequate to control all stored products pests under all conditions nor will they always provide for total reaction of this product. It is permissible and often desirable to use a low-flow recirculation system for phosphine gas in certain bulk storages. This method may be used in ship's holds, various types of flat storage and vertical storage bins. Recirculation usually involves the application of fumigant to the surface of the commodity. The phosphine gas is then continuously or intermittently drawn out of the over space and blown into the bottom of the storage using specially designed low volume fans and ductwork. This method facilitates the quick and uniform penetration of phosphine throughout the commodity. In some instances a reduced dosage may be used.

Please contact Drexel Chemical Company if assistance is required in designing the recirculation system.

#### DOSAGE

Phosphine is a mobile gas and will penetrate to all parts of the storage structure. Therefore, dosage must be based upon the total volume of the space being treated and not on the amount of commodity it contains. The same amount of this product is required to treat a 30,000-bushel silo whether it is empty or full of grain unless, of course, the surface of the commodity is sealed off by a tarpaulin.

Somewhat higher dosages, not to exceed the maximum dosage, are usually for under cooler, drier conditions or where exposure periods are relatively short. However, the major factor in selection of dosage is the ability of the structure to hold phosphine 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. In certain other fumigations, proper distribution of lethal concentrations of phosphine gas reaching all parts of the structure becomes a very important factor in dose selection. An example where this may occur is in the treatment of grain stored in tall silos. Poor gas distribution frequently results when the fumigant is added on top of the grain. In such cases, use a low-flow recirculation system under these circumstances. Please contact Drexel Chemical Company if assistance is required in designing the recirculation system.

#### MAXIMUM ALLOWABLE DOSAGE FOR FUMIGATION WITH THIS PRODUCT

13 Bags per 1,000 cu. ft.

Note: The maximum dosage allowed for dates and nuts is 4 bags per 1,000 cu. ft.

#### ADVISORY DOSAGES FOR VARIOUS TYPES OF FUMIGATION

The following dosage ranges can be used as a guideline for various types of fumigation.

Dosage For Various Fumigation Types	
Type of Storage	Dosage Range Per 1,000 Cu. Ft.
<b>Space (including packaged commodities)</b>	
Mills, Warehouses, etc.	2-6 Bags
Bagged commodities	3-6 Bags
Dried fruits, Nuts & Dates	2-4 Bags
Stored tobacco	2-4 Bags
<b>Bulk Stored Commodities</b>	
Vertical storage	3-6 Bags
Tanks	4-6 Bags
Flat storage (loose construction)	5-13 Bags
Farms bins	6-13 Bags
Railcars	3-6 Bags
Bunkers, Tarpaulin ground storage	3-6 Bags
Barges	3-7 Bags
Shipholds	3-6 Bags
Higher dosages should be considered in structures that are of loose construction and in the fumigation of bulk stored commodities in which diffusion will be slowed and result in poor distribution of hydrogen phosphide gas.	

DO NOT exceed the maximum allowable rates specified in the "MAXIMUM DOSAGE FOR FUMIGATIONS WITH THIS PRODUCT" section above.

#### PROTECTIVE CLOTHING

##### Gloves:

Gloves are not required to handle intact bags. However, wear dry gloves of cotton or other materials if contact with active or spent material from the bags is likely.

Gloves should remain dry during use.

Wash hands thoroughly after handling aluminum phosphide products. Aerate used gloves and other clothing that may be contaminated in a well-ventilated area prior to laundering.

#### RESPIRATORY PROTECTION

##### When Respiratory Protection Must Be Worn

Respiratory protection is required when concentration levels of phosphine are unknown.

##### Permissible Gas Concentration Ranges for Respiratory Protection Devices

A NIOSH/MSHA approved full-face gas mask - phosphine canister combination may be used at levels up to 15 ppm or following manufacturers use condition instructions for escape. Above 15 ppm or in situations where the phosphine concentration is unknown, a NIOSH/MSHA approved, SCBA must be worn. The NIOSH/OSHA Pocket Guide DHHS (NIOSH) 97-140 or the NIOSH ALERT - Preventing Phosphine Poisoning and Explosions During Fumigation, lists these and other types of approved respirators and the concentration limits at which they may be used.

##### Requirements for Availability of Respiratory Protection

If this product is to be applied from within the structure to be fumigated, an approved full-face gas mask - phosphine canister combination or SCBA or its equivalent must be available at the site of application in case it is needed. Respiratory protection must also be available for applications from outside the area to be fumigated such as addition of tablets or pellets to automatic dispensing devices, outdoor applications, etc.

#### REQUIREMENTS FOR CERTIFIED APPLICATOR TO BE PRESENT AND RESPONSIBLE FOR ALL WORKERS AS FOLLOWS:

- A Certified Applicator must be physically present, responsible for, and maintain visual and/or voice contact with all fumigation workers during the application of the fumigant, and also during the opening of the product containers. Once the application is complete and the structure has been made secure, the certified applicator does not need to be physically present at the site.
- A Certified Applicator must be physically present, responsible for, and maintain visual and/or voice contact with all fumigation workers during the initial opening of the fumigation structure for aeration. Once the aeration process is secured and monitoring has established that aeration can be completed safely the certified applicator does not need to be physically present and trained person(s) can complete the process and remove the placards.



- Persons with documented training in the handling of phosphine products must be responsible for receiving, aerating and removal of placards from vehicles, which have been fumigated in transit. Refer to the following section for training requirements.

#### **TRAINING REQUIREMENTS FOR RECEIPT OF INTRANSIT VEHICLES UNDER FUMIGATION.**

The trained person(s) must be trained by a Certified Applicator following the EPA accepted product applicator's manual that must precede or be attached to the outside of a transport vehicle; or by other training which is accepted by local and/or state authorities. When training has been completed and the employee demonstrates safety knowledge proficiency, the training date must be logged and maintained in the employee's safety training record for a minimum of three years. Refresher training must be done on an annual basis.

This training must cover the following items, each of which may be found in this manual:

- How to aerate the vehicle and verify that it contains no more than 0.3 ppm phosphine.
- OR
- How to transfer the commodity to another storage area without prior aeration and ensure that worker safety limits are not being exceeded during the transfer.
  - How to determine when respiratory protection must be worn.
  - How to protect workers and nearby persons from exposure to levels above the 8-hour time weighted average (TWA) of 0.3 ppm or the 15 minute TWA short-term exposure limit (STEL) of 1.0 ppm phosphine.
  - Proper removal of placards from the vehicle.
  - How to follow proper residual disposal instructions.

#### **GAS DETECTION EQUIPMENT**

There are a number of devices on the market for the measurement of phosphine gas at both industrial hygiene and fumigation levels. Glass detection tubes used in conjunction with the appropriate hand-operated air sampling pumps are widely used. These devices are portable, simple to use, do not require extensive training and are relatively rapid, inexpensive and accurate. Electronic devices are also available for both low level and high phosphine gas reading. Such devices should be used in full compliance with manufacturers' recommendations.

#### **NOTIFICATION REQUIREMENTS**

##### **Authorities and On-Site Workers**

As required by local regulations, notify the appropriate local officials (fire department, police department, etc.) of the impending fumigation. Provide to the officials an MSDS and complete label for the product and any other technical information deemed useful. Offer to review this information with the local official(s).

##### **Incidents Involving These Products**

Registrant must be informed of any incident involving the use of this product. Please report as soon as possible to DREXEL CHEMICAL COMPANY AT: PHONE (901) 774-4370. ADDRESS: P.O. BOX 13327, MEMPHIS, TN 38113-0327.

##### **Theft of These Products**

Immediately report to the local police department thefts of metal phosphide fumigants.

#### **APPLICATOR AND WORKER EXPOSURE**

##### **Exposure Limits**

Exposure to phosphine must not exceed 0.3 ppm measured as an eight-hour time-weighted average (TWA), or the 15-minute short-term exposure limit (STEL) of 1.0 ppm phosphine. All persons are covered by these exposure standards.

##### **Application of Fumigant**

At least two persons, a certified applicator and trained person, or two trained persons under the direct supervision of the certified applicator must be present when entry into the structure for application of the fumigant is required. Depending upon temperature and humidity, this product releases phosphine gas slowly upon exposure to moisture from the air. In most cases, this release is 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 will exceed the allowable limits, approved respiratory protection must be worn.

##### **Leakage from Fumigated Sites**

Phosphine gas is highly mobile and given enough time may penetrate seemingly gas tight materials such as concrete and cinder blocks. Therefore, adjacent, enclosed areas likely to be occupied must be examined to ensure that significant leakage has not occurred. Sealing of the fumigated site and/or airflow into the occupied areas must be sufficient to bring down the phosphine concentration to a safe level of 0.3 ppm or below.

#### **Aeration and Reentry**

If the structure is to be entered after fumigation, it must be aerated until the level of phosphine 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 (i.e., over industrial hygiene levels of phosphine). Do not allow re-entry into treated areas by any person before the level of phosphine reaches 0.3 ppm or below unless protected by an approved respirator.

#### **Handling Un aerated Commodities**

Transfer of incompletely aerated commodity via bulk handling equipment such as augers, drag conveyors and conveyor belts to a new storage structure is permissible. A Certified Applicator is responsible for training workers who handle the transfer of incompletely aerated listed commodities, and appropriate measures must be taken (i.e., ventilation or respiratory protection) to prevent exposures from exceeding the exposure limits for phosphine. The new storage structure must be placarded if it contains more than 0.3 ppm phosphine. If the fumigation structure must be entered to complete the transfer, at least two trained persons, wearing proper respiratory protection may enter the structure. A certified applicator must be physically present during the entry into the structure. REMEMBER transporting containers or vehicles under fumigation over public roads is prohibited.

#### **Industrial Hygiene Monitoring**

Phosphine exposures must be documented in an operations log or manual at each fumigation area and operation where exposures may occur. Monitor airborne phosphine concentrations in all indoor areas to which fumigators and other workers have had access during fumigation and aeration. Perform such monitoring in workers' breathing zones. This monitoring is mandatory and is performed to determine when and where respiratory protection is required. Once exposures have been adequately characterized, spot checks must be made, especially if conditions change significantly or if an unexpected garlic odor is detected or a change in phosphine level is suspected.

#### **Engineering Controls and Work Practices**

If monitoring shows that workers may be exposed to concentrations in excess of the permitted limits, then engineering controls (such as forced air ventilation) and/or appropriate work practices must be used to reduce exposure to within permitted limits. Appropriate respiratory protection must be worn if phosphine exposure limits are exceeded or concentrations are unknown.

#### **PLACARDING OF FUMIGATED AREAS**

All entrances to the fumigated area must be placarded. Placards must be made of substantial material that can be expected to withstand adverse weather conditions, and must bear the wording as follows:

1. The signal word DANGER/PELIGRO and the SKULL AND CROSSBONES symbol in red.
2. The statement "Structure and/or commodity under fumigation, DO NOT ENTER/NO ENTRE".
3. The Statement, "This sign may only be removed by a certified applicator or a person with documented training after the structure and/or commodity is completely aerated (contains 0.3 ppm or less of phosphine gas)".  
If incompletely aerated commodity is transferred to a new storage structure, the new structure must also be placarded if it contains more than 0.3 ppm. Workers exposure during this transfer must not exceed allowable limits.
4. The date the fumigation begins.
5. Name and EPA registration number of fumigant used.
6. Name, address and telephone number of the fumigation company and/or applicator.
7. A 24-hour emergency response telephone number.

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

Do not remove placards until the treated commodity or area is aerated down to 0.3 ppm hydrogen phosphide or less. To determine whether aeration is complete, each fumigated structure or transport vehicle must be monitored and shown to contain 0.3 ppm or less phosphine gas in the air space around and, if feasible, in the mass of the commodity.

#### **SEALING OF STRUCTURES**

The structure to be fumigated must first be inspected to determine if it can be made sufficiently gas tight. Careful sealing is required so that adequate gas levels are retained. Turn off all ventilation, supply air, air conditioning, and any other air moving systems which could negatively

affect the fumigation. Thoroughly inspect the structure to be fumigated and seal cracks, holes and openings. These areas could include, but are not limited to: windows, doors, vents, chimneys and structural flaws. Sealing techniques can vary, but most often include polyethylene sheeting, adhesive tapes and adhesive sprays. Expandable foam or caulking material can work well on structural flaws. Proper sealing will insure sufficient gas levels within the fumigated structure and will decrease the chance of unwanted exposures outside of the fumigated area.

As with all fumigations, it is required that sealing be inspected for leaks. If phosphine above 0.3 ppm is found in an area where exposure to workers or bystanders may occur, the fumigator, using proper respiratory protective equipment must attempt to seal the leak from the exterior of the structure. Failing this, the fumigators, following proper procedures to prevent accidental poisoning, may enter the structure and seal the leaks from the interior. If the concentration inside the structure has decreased below the target level as a result of the leakage, additional fumigant may be added following the sealing repairs. **DO NOT FUMIGATE A STRUCTURE THAT CANNOT BE SEALED SUFFICIENTLY GAS TIGHT.**

### AERATION OF FUMIGATED COMMODITIES

As an alternative to the aeration time periods listed below, each container of the treated commodity may be analyzed for residues using accepted analytical methods.

#### Foods and Feeds

Tolerances for phosphine residues have been established at 0.1 ppm for animal feeds and 0.01 ppm for processed 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.

#### Non-food Commodities

Aerate all non-food commodities to 0.3 ppm or less of phosphine. Monitor densely packed commodities to ensure that aeration is complete.

#### Tobacco

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

### TRANSPORTATION INSTRUCTIONS

The United States Department of Transportation (DOT) classifies aluminum phosphide as "Dangerous When Wet" material and it must be transported in accordance with DOT regulations.

**Transport Designations** - The following transport designations apply to aluminum phosphide.

Proper Shipping Name:	Aluminum Phosphide
Hazard Class:	4.3
Identification No.:	UN 1397
Packing Group:	PG I
Shipping Label:	Dangerous When Wet/Poison
Shipping Placard:	Dangerous When Wet

#### Transportation Special Permit:

#### EXEMPTION DOT-E 11342

#### Modes of Transportation Authorized: Motor Vehicle

(Only private motor vehicles used in pest control operations are authorized to transport the packages covered by the terms of this exemption.)  
NOTE: You must have a copy of this exemption with you during transportation.

A copy of Exemption DOT-E 11342 can be obtained from **DREXEL CHEMICAL COMPANY AT: PHONE (901) 774-4370. ADDRESS: P.O. BOX 13327, MEMPHIS, TN 38113-0327.**

### REQUIRED WRITTEN FUMIGATION MANAGEMENT PLAN

The certified applicator is responsible for working with the owners and/or responsible employees of the structure and/or area to be fumigated to develop and follow a Fumigation Management Plan (FMP). State, county and local authorities may also have specific requirements. The FMP must be written **PRIOR TO EVERY** treatment including fumigation treatment for burrowing pests. The FMP must address characterization of the structure and/or area, and include appropriate monitoring and notification requirements, consistent with, but not limited to, the following:

1. Inspect the structure and/or area to determine its suitability for fumigation.
2. When sealing is required, consult previous records for any changes to the structure, seal leaks, and monitor any occupied adjacent buildings.

3. Prior to each fumigation, review any existing FMP, MSDS, Applicator's Manual and other relevant safety procedures with company officials and appropriate employees.
4. Consult company officials in the development of procedures and appropriate safety measures for nearby workers that will be in and around the area during application and aeration.
5. Consult with company officials to develop an appropriate monitoring plan that will confirm that nearby workers and bystanders are not exposed to levels above the allowed limits during application, fumigation and aeration. This plan must also demonstrate that nearby residents will not be exposed to concentrations above the allowable limits.
6. Consult with company officials to develop procedures for local authorities to notify nearby residents in the event of an emergency.
7. Confirm the placement of placards to secure entrance into any area under fumigation.
8. Confirm the required safety equipment is in place and the necessary manpower is available to complete a safe and effective fumigation.
9. Written notification must be provided to the receiver of a vehicle that is fumigated in-transit.

These factors **must** be considered in putting an FMP together. It is important to note that some plans will be more comprehensive than others. All plans should reflect the experience and expertise of the applicator and circumstances at and around the structure and/or area. In addition to the plan, the applicator must read the complete label and applicator manual, follow its directions carefully and abide by all the restrictions. If the applicator has any questions about the development of an FMP, contact Drexel Chemical Company for further assistance. The FMP and related documentation, including monitoring records, must be maintained for a minimum of 2 years.

### STEPS FOR PREPARATION OF THE REQUIRED WRITTEN FUMIGATION MANAGEMENT PLAN

#### Purpose

A Fumigation Management Plan (FMP) is an organized, written description of the required steps involved to help ensure a safe, legal and effective fumigation. It will also assist you and others in complying with pesticide product label requirements. The guidance that follows is designed to help assist you in addressing all the necessary factors involved in preparing for and fumigating a structure and/or area.

This guidance is intended to help you organize any fumigation that you might perform **PRIOR TO ACTUAL TREATMENT**. It is meant to be somewhat prescriptive, yet flexible enough to allow the experience and expertise of the fumigator to make changes based on circumstances which may exist in the field. By following a step-by-step procedure, which allow for flexibility, an effective fumigation may be performed.

Before any fumigation begins, read and review the entire label which includes the container label and Applicator's Manual. This information must also be given to the appropriate company officials (supervisors, foreman, safety officer, etc.) in charge of the site. Preparation is the key to any successful fumigation. If you do not find specific instructions for the type of fumigation that you are to perform listed in this Guidance Document you will want to construct a similar set of procedures using this document as your guide or contact Drexel Chemical Company for assistance. Finally, before any fumigation begins you must be familiar with and comply with all applicable federal, state and local regulations. The success of the fumigation is not only dependent on your ability to do your job but also upon carefully following all rules, regulations, and procedures required by governmental agencies.

#### A Checklist Guide for a Fumigation Management Plan

This checklist is provided to help you take into account factors that must be addressed prior to performing all fumigations. It emphasizes safety steps to protect people and property. The checklist is general in nature and cannot be expected to apply to all types of fumigation situations. It is to be used as a guide to prepare the required plan. Each item must be considered. However, it is understood that each fumigation is different and not all items will be necessary for each fumigation site.

#### A. PRELIMINARY PLANNING AND PREPARATION

1. Determine the purpose of the fumigation.
  - a. Elimination of insect infestation
  - b. Elimination of vertebrate pests
  - c. Plant pest quarantine.
2. Determine the type of fumigation, for example
  - a. Space; tarp, mill, warehouse, food plant, or outdoor area
  - b. Transport Vehicle; railcar, truck, van, container

10  
16

- c. Commodity; raw agricultural or processed foods or non-food
  - d. Type of Storage: vertical silo, farm storage, flat storage, etc.
  - e. Vessels; ship or barge. In addition to the Applicator's Manual, read the US Coast Guard Regulations 46 CFR 147A.
3. Fully acquaint yourself with the structure and commodity to be fumigated, including:
- a. The general structure layout, construction (materials, design, age, maintenance), of the structure, fire or combustibility hazards, connecting structures and escape routes, above and below ground, and other unique hazards or structure characteristics. Prepare, with the owner/operator/person in charge a drawing or sketch of structure to be fumigated, delineating features, hazards, and other structural characteristics.
  - b. The number and identification of persons who routinely enter the area to be fumigated (i.e. employees, visitors, customers, etc.)
  - c. The specific commodity to be fumigated, its mode of storage, and its condition.
  - d. The previous treatment history of the commodity, if available.
  - e. Accessibility of utility service connections.
  - f. Nearest telephone or other means of communication. Mark the location of these items on the drawing/sketch.
  - g. Emergency shut-off stations for electricity, water and gas. Mark the location of these items on the drawing/sketch.
  - h. Current emergency telephone numbers of local Health, Fire, Police, Hospital and Physician responders.
  - i. Name and phone number (both day and night) of appropriate company officials.
  - j. Check, mark and prepare the points of fumigation application locations if the job involves entry into the structure for fumigation.
  - k. Read and review the entire label which includes the container label and Applicator's Manual.
  - l. Exposure time considerations.
    - 1. Product to be used.
    - 2. Minimum fumigation period, as defined and described by the label use directions
    - 3. Down time required to be available
    - 4. Aeration requirements
    - 5. Cleanup requirements, including dry or wet deactivation methods, equipment, and personnel needs, if necessary
    - 6. Measured and recorded commodity temperature and moisture
  - m. Determination of dosage
    - 1. Cubic footage or other appropriate space/location calculations
    - 2. Structure sealing capability and methods
    - 3. Label directions
    - 4. Temperature, humidity, wind
    - 5. Commodity/space volume
    - 6. Past history of fumigation of structure
    - 7. Exposure time

**B. PERSONNEL**

- 1. Confirm in writing that all personnel in and around the structure and/or area to be fumigated have been notified prior to application of the fumigant. Consider using a checklist that each employee initials indicating they have been notified.
- 2. Instruct all fumigation personnel to read the Applicator's Manual. Fumigation personnel must be trained in the proper method of application, the hazards that may be encountered, and the selection of personal protection devices including detection equipment.
- 3. Confirm that all personnel are aware of and know how to proceed in case of an emergency situation.
- 4. Instruct all personnel on how to report any accident and/or incidents related to fumigant exposure. Provide a telephone number for emergency response reporting.
- 5. Instruct all personnel to report to proper authorities any theft of fumigant and/or equipment related to fumigation.
- 6. Establish a meeting area for all personnel in case of emergency.

**C. MONITORING**

- 1. Safety
  - a. Monitoring phosphine concentrations must be conducted in areas to prevent excessive exposure and to determine where exposure may occur. Document where monitoring will occur.

- b. Keep a log or manual of monitoring records for each fumigation site. This log must at a minimum contain the timing, number of readings taken and level of concentrations found in each location.
- c. When monitoring, document even if there is no phosphine present above the safe levels. In such cases, subsequent monitoring is not routinely required. However spot checks must be made occasionally, especially if conditions change significantly.

**2. Efficacy**

- a. For stationary structures, phosphine readings MUST be taken from within the fumigated structure to insure proper gas concentrations. If the phosphine concentrations have fallen below the targeted level the fumigators, following proper entry procedures may re-enter the structure and add additional product.
- b. All phosphine concentration readings must be documented.

**D. NOTIFICATION**

- 1. Confirm the appropriate local authorities (fire departments, police departments, etc.) have been notified as per label instructions, local ordinances if applicable, or instructions of the client.
- 2. Prepare written procedure ("Emergency Response Plan"), which contains explicit instructions, names, and telephone numbers so as to be able to notify local authorities if phosphine levels are exceeded in an area that could be dangerous to bystanders and/or domestic animals.
- 3. Confirm that the receiver of in-transit vehicles under fumigation have been notified and are trained according to the "TRAINING REQUIREMENTS FOR RECEIPT OF INTRANSIT VEHICLE UNDER FUMIGATION" section of this Applicator's Manual.

**E. SEALING PROCEDURES**

- 1. Sealing must be adequate to control the pests. Care should be taken to insure that sealing materials would remain intact until the fumigation is complete.
- 2. If the structure has been fumigated before, review the previous FMP for previous sealing information.
- 3. Make sure that construction/remodeling has not changed the building in a manner that will affect the fumigation.
- 4. Warning placards must be placed on every possible entrance to the fumigation structure.

**F. APPLICATION PROCEDURES & FUMIGATION PERIOD**

- 1. Plan carefully and apply all fumigants in accordance with the label requirements.
- 2. When entering into the area under fumigation, always work with two or more people under the direct supervision of a certified applicator wearing appropriate respirators.
- 3. Apply fumigant from the outside where appropriate.
- 4. Provide watchmen when the possibility of entry into the fumigated site by unauthorized persons cannot otherwise be assured.
- 5. When entering structures, always follow OSHA rules for confined spaces.
- 6. Document that the receiver of vehicles fumigated in-transit has been notified.
- 7. Turn off any electric lights in the fumigated area of the structure as well as all non-essential electrical motors.

**G. POST-APPLICATION OPERATIONS**

- 1. Provide watchmen when the fumigation structure cannot be secured from entry by unauthorized persons during the aeration process.
- 2. Aerate in accordance with structural limitations.
- 3. Turn on ventilating or aerating fans where appropriate.
- 4. Use a suitable gas detector before re-entry into a fumigated structure to determine fumigant concentration.
- 5. Keep written records of monitoring to document completion of aeration.
- 6. Consider temperature when aerating.
- 7. Ensure that aeration is complete before moving a treated vehicle onto public roads.
- 8. Remove warning placards when aeration is complete.
- 9. Inform business/client that employees/other persons may return to work or otherwise be allowed to re-enter the aerated structure.

**APPLICATION PROCEDURES**

An FMP must be written PRIOR to all applications.  
 An FMP must be devised to cover application and exposure period, aeration and disposal of the fumigant so as to keep to a minimum any human exposure to phosphine and to help assure adequate control of the insect pests.

## Farm Bins

Leakage is the single most important cause of failures in the treatment of farm storages. Since these storages are often small, they usually have a higher leakage area in proportion to their capacity. Most wooden storage structures are so porous that they cannot be successfully fumigated unless they are completely tarped. Do not fumigate a storage that will be entered by humans or animals prior to aeration. Do not fumigate areas which house sensitive equipment containing copper or other metals likely to be corroded by phosphine gas.

1. Read and review the entire label which includes the container label and Applicator's Manual.
2. Inspect the bin to determine if you can fumigate effectively.
3. Develop an appropriate Fumigation Management Plan.
4. If the bin is located in an area where nearby workers and/or bystanders or domestic animals would be exposed to phosphine gas because of leakage from the bin:
  - (i) Develop a monitoring procedure that will confirm if leakage from the bin is above the allowable limits in an area that would affect nearby workers or bystanders.
  - (ii) Advise local authorities when and where you will be fumigating. Provide and review with them the MSDS, Applicator's Manual and other relevant safety information.
5. If the bin is in an isolated area on private property (i) and (ii) above are not required.
6. Seal the bin as tightly as possible. Cover the surface of the grain with poly after this product has been applied. Tarping the grain surface will greatly reduce the leak rate of the gas as well as reduce the required amount of this product. Only the volume below the tarp must be dosed. If not tarped, the entire volume of the storage must be treated, whether full or empty.
7. Bags of this product may be scattered over the surface or probed into the grain.
8. Use about 8 to 16 bags per 1,000 bu. or 8 to 16 bags per 1,000 cu. ft. Probe the dosage uniformly over the surface.
9. Immediately cover the surface of the grain with a plastic tarpaulin.
10. Place no more than 25 percent of the total dose at the bottom if the bin is equipped with aeration fans. **CAUTION:** Make sure that the aeration duct is dry before adding this product. Addition of this product to water in an aeration duct may result in a fire.
11. Seal the aeration fan with 4-mil plastic sheeting.
12. Place warning placards on all entrances to the bin and near the ladder.
13. Following aeration of the bin, the surface of the grain may be sprayed with an approved protectant to discourage reinfestation.

**Note:** If monitoring equipment is not available, an approved canister respirator must be worn during application from within an enclosed area.

## Flat Storages

Treatments of these types of storages often require considerable time and physical effort. Therefore, sufficient manpower should be available to complete the work rapidly enough to prevent excessive exposure to phosphine gas. Vent flasks outside the storage, conduct fumigations during cooler periods, and employ other work practices to minimize exposures. It is likely that respiratory protection will be required during application of fumigant to flat storages. Refer to the sections on "APPLICATOR AND WORKER EXPOSURE AND RESPIRATORY PROTECTION".

1. Inspect the site to determine its suitability for fumigation.
2. Determine if the structure is in an area where leakage during fumigation or aeration would adversely affect nearby workers or bystanders if concentrations were above the permitted exposure levels.
3. Develop an appropriate Fumigation Management Plan. (Refer to FMP guidelines.)
4. Consult previous records for any changes to the structure. Seal vents, cracks and other sources of leaks.
5. Using the Applicator's Manual, determine the length of the fumigation and calculate the dosage of bags to be applied based upon volume of the building, contents, air and/or commodity temperature and the general tightness of the structure.
6. Apply bags by surface application, shallow probing or deep probing. It is advisable to place about 25 percent of the dosage in the floor level aeration ducts. Check the ducts prior to addition of this product to make sure that they contain no liquid water.
7. Placement of plastic tarp over the surface of the commodity is often advisable, particularly if the overhead of the storage cannot be well sealed.
8. Lock all entrances to the storage and post fumigation warning placards.

9. Bins need to be aerated unless re-entry into the storage is required.

10. Remove and dispose of bags prior to emptying bin or during emptying if the bags cannot be retrieved otherwise.

## Vertical storages (concrete upright bins and other silos in which grain can be rapidly transferred)

This product may be added to the commodity as the bin is filled, but must be removed as the bin is emptied. Bags of this product are most suited to this application since they can be automatically added to the commodity and are not removed after fumigation. Refer to this Applicator's Manual for instructions.

1. Inspect the site to determine its suitability for fumigation.
2. Determine if the structure is in an area where leakage during fumigation or aeration would expose nearby workers or bystanders to concentrations above the permitted levels.
3. Develop an appropriate Fumigation Management Plan. (Refer to FMP guidelines.)
4. Consult previous records for any changes to the structure. Close openings and seal cracks to make the structure as airtight as possible. Prior to the fumigation, seal the vents near the bin top, and any openings which connect to adjacent bins.
5. Determine the length of the fumigation and calculate the dosage of bags to be applied based upon volume of the building, air and/or commodity temperature and the general tightness of the structure.
6. Bags may be applied continuously by hand on the headhouse/gallery belt or into the fill opening as the commodity is loaded into the bin. All bags must be removed when the bin is emptied. Monitoring must be conducted during application to determine the need for respiratory protection.
7. Keep an accurate count of bags added since the bags must be removed when the bin is emptied. Bags can be removed by transfer of the commodity through a screen or scale operator.
8. Seal the bin deck openings after the fumigation has been completed.
9. Bins requiring more than 24 hours to fill should not be fumigated by continuous addition into the commodity stream. Probing, surface application, or other appropriate means may be employed to fumigate these bins. Exposure periods should be lengthened to allow for diffusion of gas to all parts of the bin if this product has not been applied uniformly throughout the commodity mass.
10. Place warning placards on the discharge gate and on all entrances.

## Mills, Food Processing Plants and Warehouses

1. Inspect the site to determine its suitability for fumigation.
2. Determine if the structure is in an area where leakage during fumigation or aeration would expose nearby workers or bystanders if concentrations were above the permitted exposure levels.
3. Develop an appropriate Fumigation Management Plan. (Refer to FMP guidelines.)
4. Determine the length of the fumigation and calculate the dosage of tablets or pellets to be applied based upon volume of the building, air and/or commodity temperature and the general tightness of the structure.
5. Read the directions found in "PHYSICAL AND CHEMICAL HAZARDS" section and remove or cover any of the listed items that can become damaged from exposure to phosphine gas.
6. Consult previous records for any changes in the structure. Carefully seal and placard the space to be fumigated.
7. Place bags on floor in a systematic manner, beginning at the point furthest from the exit door. Do not toss bags into inaccessible areas. Do not pile bags. Spread bags so they are not touching.
8. Bags of this product are not to be placed in or attached to commodity packages containing processed food. If bags cannot be placed on the floor, attached to walls or other support. Bags may be taped to a cardboard disc and disc attached to commodity packaging.
9. Turn off any lights within the treated area and shut off all electrical motors not essential to operations of the storage. Doors leading to the fumigated space must be closed, sealed, and placarded with warning signs.
10. Upon completion of the exposure period, open windows, doors, vents, etc. Allow the fumigated structure to aerate. Do not enter the structure without proper Personal Protective Equipment (PPE) until gas readings have been taken and the concentration is below the allowable limits. Gas concentration readings may be taken using low-level detector tubes or similar devices to ensure safety of personnel who re-enter the treated area.
11. Collect the spent bags of this product and dispose of it, with or without further deactivation. Refer to "PESTICIDE AND CONTAINER DISPOSAL INSTRUCTIONS" section in this manual for instructions.

12. Remove fumigation warning placards from the aerated structure.

#### **Railcars, Containers, Trucks, Vans, and Other Transport Vehicles**

Develop an appropriate Fumigation Management Plan.

Railcars, containers, trucks, vans, and other transport vehicles shipped piggyback by rail may be fumigated in-transit. However, the aeration of railcars, railroad boxcars, containers and other vehicles is prohibited enroute. It is not legal to move trucks, trailers, containers, vans, etc., over public roads or highways until they have been aerated.

Transport vehicles loaded with bulk commodities, to which bags of this product may be added directly, are treated in essentially the same way as any other flat storage facility. This product may be added as the vehicle is being filled. The dose may be scattered over the surface after loading has been completed or the bags may be probed below the surface. Carefully seal any vents, cracks or other leaks, particularly if the fumigation is to be carried out in-transit. See "PLACARDING OF FUMIGATED AREAS" section of this Applicator's Manual for placarding requirements.

(Drex-PH<sub>3</sub> Bags are recommended for the treatment of transport vehicles or similar storages containing processed foods for which no direct contact is allowed with tablets or pellets.)

#### **PROCEDURES FOR PROCESSED FOODS**

Bags of this product must not come into contact with processed foods. Bags must be applied in such a way as to prevent contact with the commodity or its packaging.

#### **BULK RAIL CARS**

1. Close and secure all hatch covers except those being utilized for the fumigation.
2. Seal all other openings. Pay particular attention to vents.
3. Clean the flange lip of hatch (or hatches) being utilized. If the commodity extends into the throat of the hatch, force it away as far as possible.
4. Open bag containers and tape bags to cardboard disc. Be sure to tape across the bag ends only.
5. Place the disc into position, bag side up, and secure with masking tape.
6. Lower the cover into place and secure. Tape "Warning"/"Danger" placards securely to the hatch cover.

#### **PROCEDURES FOR BOXCARS**

1. Close and secure one of the doors from the inside. Seal all openings and joints. If possible, caulk joints and drape entire doorway with polyethylene film, securing the edges to the inner wall, floor and ceiling with masking tape.
2. Inspect the roof, floor and walls for holes and/or cracks. Seal all openings.
3. If possible, drape remaining doorway with polyethylene film before door is closed. Secure edges to door jams and floor. Close door and secure. If doorway is draped with polyethylene, it may not be necessary to seal the door from the outside. If door is not draped, seal all cracks, openings and joints from the outside.
4. Open containers of bags and tape bags to cardboard discs. Be sure to tape across the bag ends only.
5. Place the loaded discs inside the boxcar and secure, bag side up, with tape or nail to the wall.
6. Post "Warning"/"Danger" placards on each door.

#### **PROCEDURES FOR CONTAINERS**

Procedures for trucks, vans and other transport containers are essentially the same as boxcars, except their doors tend to be more gas tight, and they often have only a rear door, which must be sealed after application is completed.

The shipper and/or the fumigator must provide written notification to the receiver of railcars, railroad boxcars, shipping containers and other vehicles, which are being fumigated in-transit. A copy of the Applicator's Manual must precede or accompany all transportation containers or vehicles. If the Applicator's Manual is sent with the transport vehicle, it must be placed securely on the outside of the vehicle.

Proper handling of treated railcars at their destination is the responsibility of the consignee. Upon receipt of the railcar, railroad boxcars, shipping container and other vehicles, a certified applicator and/or persons with documented authorized training must supervise the aeration process and removal of the placards.

Do not use bags of this product in cars or other personal vehicles.

#### **Tarpaulin and Bunker Fumigations**

Use of plastic sheeting or tarpaulins to cover commodities is one of the easiest and least expensive means for providing relatively gas tight enclosures which are very well suited for fumigation. Poly tarps are penetrated only very slowly by phosphine gas and tight coverings are

readily formed from the sheets. The volume of these enclosures may vary widely from a few cubic feet (for example, a fumigation tarpaulin placed over a small stack of bagged commodity) to a plastic bunker storage capable of holding 600,000 bushels of grain or more.

1. Develop an enclosure suitable for fumigation by covering bulk or packaged commodities with poly sheeting. The sheets may be taped together to provide a sufficient width of material to ensure that adequate sealing is obtained. If the flooring upon which the commodity rests is of wood or other porous material, the commodity to be fumigated must be repositioned onto poly prior to covering for fumigation. The plastic covering of the pile may be sealed to the floor using sand or water snakes, by shoveling soil or sand onto the ends of the plastic covering or by other suitable procedures. The poly covering must be reinforced by tape or other means around any sharp corners or edges in the stack so as to reduce the risk of tearing. Thinner poly, about 2 mil, is suitable for most indoor tarp fumigations and for sealing of windows, doors and other openings in structures. However, 4 mil poly or thicker is more suitable for outdoor applications where wind or other mechanical stresses are likely to be encountered.
2. Determine if the enclosure is in an area where leakage during fumigation or aeration would affect nearby workers or bystanders.
3. Develop an appropriate Fumigant Management Plan. (Refer to FMP guidelines.)
4. Using the guidance given under "EXPOSURE CONDITIONS FOR ALL FUMIGATIONS" section, determine the length of the fumigation and calculate the dosage of bags to be applied based upon volume of space under the tarp, air and/or commodity temperature.
5. Bags may be applied to the tarped stack or bunker storage of bulk commodity through slits in the poly covering. Probing or other means of dosing may be used. Avoid application of large amounts of this product at any one point. This product should be added below the surface of the commodity if condensation or other source of moisture is likely to form beneath the poly. The slits in the covering should be carefully taped to prevent loss of gas once the dose has been applied and the introduction of water from rain. Drex-PH<sub>3</sub> Bags taped to cardboard discs may be used for the treatment of bagged commodities and processed foods. Care should be taken to see that the poly is not allowed to cover this product and prevent contact with moist air or confine the gas.
6. Distribution of phosphine gas is generally not a problem in the treatment of bagged commodities and processed foods. However, fumigation of larger bunker storages containing bulk commodity will require proper application procedures to obtain adequate results.
7. Place warning placards at conspicuous points on the enclosure.

#### **In-transit Shiphold Fumigation**

##### **USE INFORMATION**

Important – In-transit ship or shiphold fumigation is also governed by U.S. Coast Guard Regulation 46 CFR 147A, Interim Regulations for Shipboard Fumigation. Refer to this regulation prior to fumigation. For further information contact:

Commandant  
U.S. Coast Guard  
Hazardous Materials Standards Division  
GMSO-3  
Washington, DC 20593-0001

**PRE-VOYAGE FUMIGATION PROCEDURES** – An FMP must be written for all fumigations PRIOR TO ACTUAL TREATMENT.

1. Prior to fumigating a vessel for in-transit cargo fumigation, the master of the vessel, or his representative, and the certified applicator 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 vessel does not meet these requirements, then the vessel must not be fumigated unless all crew members are removed from the vessel. The crew members are not permitted to reoccupy the vessel until it has been properly aerated and the master of the vessel and the certified applicator have made a determination that the vessel is safe for occupancy.
2. The certified applicator 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 any vessel containing 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.

- \*Note: Personal protection equipment means a NIOSH/MSHA approved respirator or gas mask fitted with an approved canister for phosphine. The canister is approved for use up to 15 ppm. SCBA or its equivalent must be used above 15 ppm or at unknown concentrations.
3. Seal all openings to the cargo hold or tank and lock or otherwise secure all openings, manways, etc., which might be used to enter the hold. The overspace pressure relief system of each tank aboard tankers must be sealed by closing the appropriate valves and sealing the openings into the overspace with gas tight materials.
  4. Placard all entrances to the treated spaces with fumigation warning signs.
  5. If the fumigation is not completed and the vessel aerated before the manned vessel leaves port, the person in charge of the vessel shall ensure that at least two units of personal protection equipment and one phosphine gas detection device, and a person qualified in their operation be on board the vessel during the voyage.
  6. During the fumigation, or until a manned vessel leaves port or the cargo is aerated, the certified applicator shall ensure that a qualified person using phosphine gas detection equipment tests spaces adjacent to areas containing fumigated cargo as well as all regularly occupied spaces for fumigant leakage. If leakage of the fumigant is detected, the person in charge of the fumigation shall take action to correct the leakage, or shall inform the master of the vessel, or his representative, of the leakage so that corrective action can be taken.
  7. Review with the master, or his representative, the precautions and procedures to follow during the voyage of a shiphold in-transit fumigation.

#### APPLICATION PROCEDURES FOR BULK DRY CARGO VESSELS AND TANKERS

1. After a hold has been filled or completed, open containers and distribute bags uniformly onto commodity surface with spacing between each. Do not place bags within 10 feet of sidewalls. Step on each bag after placement or probe bags into commodity.
2. Immediately after application of the fumigant, observe the closing of all hatch covers, tank tops, butterworth valves, manways, etc. Stop the closing if the cover snags an individual bag. Reposition the bag and resume closing.

#### IN-TRANSIT FUMIGATION OF TRANSPORT UNITS (CONTAINERS) ABOARD SHIPS

In-transit fumigation of transport units on ships is also governed by DOT RSPA 49 CFR 176.76(h) Transport Vehicles, Freight Containers, and Portable Tanks Containing Hazardous Materials and International Maritime Dangerous Goods Code P9025-1 Amdt. 27-94.

Application procedures for fumigation of raw commodities or processed foods in transport units (containers) are described in "RAILCARS, CONTAINERS, TRUCKS, VANS AND OTHER TRANSPORT VEHICLES" section of this manual.

#### PRECAUTIONS AND PROCEDURES DURING VOYAGE

1. Using appropriate gas detection equipment, monitor spaces adjacent to areas containing fumigated cargo and all regularly occupied areas for fumigant leakage. If leakage is detected, the area should be evacuated of all personnel, ventilated, and action taken to correct the leakage before allowing the area to be occupied.
2. Do not enter fumigated areas except under emergency conditions. If necessary to enter a fumigated area, appropriate personal protection equipment must be used. Never enter fumigated areas alone. At least one other person, wearing personal protection equipment, should be available to assist in case of an emergency.

#### PRECAUTIONS AND PROCEDURES DURING DISCHARGE

If necessary to enter holds prior to discharge, test spaces directly above grain surface for fumigant concentration, using appropriate gas detection and personal safety equipment. Do not allow entry to fumigated areas without personal safety equipment, unless fumigant concentrations are at safe levels, as indicated by a suitable detector.

#### BARGES

Barge fumigation is also regulated by U. S. Coast Guard Regulation 46 CFR 147A as modified by U. S. Coast Guard Special Permit 2-75. This permit, which must be obtained prior to the fumigation, is available from:

Commandant  
U. S. Coast Guard  
Hazardous Materials Standards Div.  
GMSO-3  
Washington, DC 20593 0001

Leaks are a common cause of failures in the treatment of commodities

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aboard barge. Carefully inspect all hatch covers prior to application of this product and seal, if necessary. Placard the barge. Notify consignee if the barge is to be fumigated in-transit and provide safety instructions for receipt and unloading.

## STORAGE AND DISPOSAL

### Do not contaminate water, food or feed by storage and disposal. PESTICIDE STORAGE INSTRUCTIONS

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

Do not store in buildings where humans or domestic animals reside. Keep out of reach of children.

The labeling of the storage area should take into account the needs of a variety of organizations. These should include, but not be limited to company policy, insurance carrier, Occupational Safety and Health Administration (OSHA), Emergency Planning and Right to Know and local emergency response professionals. At a minimum, the storage must be marked with the following signs and must be locked:

1. Danger, Poison (with skull and cross bones)
2. Authorized Personnel Only
3. National Fire Protection Association (NFPA) Hazard Identification Symbols

The National Fire Protection Association (NFPA) has developed Hazard Identification Symbols. This standardized system is designed to provide, at a glance the information regarding the health, fire and reactivity hazards associated with hazardous materials.

The following are the hazard categories and degree of hazard for aluminum phosphide:

Category	Degree of Hazard
Health	4 (Severe Hazard)
Flammability	4 (Severe Hazard)
Reactivity	2 (Moderate)
Special Notice Key	W

**Note:** When using the NFPA Hazard Identification System, the characteristics of all hazardous materials stored in a particular area must be considered. The local fire protection district should be consulted for guidance on the selection and placement of such signs.

### PESTICIDE AND CONTAINER DISPOSAL INSTRUCTIONS

Do not contaminate water, food or feed by storage or disposal. Unreacted or partially reacted form of this product is acutely hazardous.

Improper disposal of excess pesticide is a violation of Federal law. If these wastes cannot be disposed of by use according to the Applicator's Manual 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, see the following "SPILL AND LEAK PROCEDURES", "DEACTIVATION PROCEDURES" and "DISPOSAL PROCEDURES" sections of this manual.

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

#### Container Disposal:

The containers are nonrefillable. Do not reuse or refill containers. Offer for recycling, if available. Triple rinse cans, drums or foil pouches with water if they have been contacted with spent or partially reacted dust from bags of this product. They may then be recycled or reconditioned, or punctured and disposed of in a sanitary landfill, or by other procedures approved by state and local authorities. Rinsate may be disposed of in a sanitary landfill by pouring it out onto the ground or by other approved procedures. It is also permissible to remove lids and expose empty flasks to atmospheric conditions until residue is reacted. In this case, puncture and dispose of in a sanitary landfill or other approved site, or by other procedures approved by state and local authorities.

#### Residual Dust:

If properly exposed, the residual dust remaining after a fumigation with this product will be a grayish white powder. This will be a non-hazardous residue.

(Continued)

## STORAGE AND DISPOSAL (Cont.)

ardous waste and contain only a small amount of unreacted aluminum phosphide. However, residual dust from incompletely exposed form of this product, (so called green dust) requires special care.

Do not confine spent or partial spent bags in a closed containers as this may result in a fire hazard. Small amounts of hydrogen phosphide may be given off from the unreacted aluminum phosphide, and confinement of the gas may result in a flash. Unless it can be determined with certainty that the bags are spent, they must be deactivated as described below prior to disposal.

### Disposal of Unreacted or Partially reacted Drex-PH<sub>3</sub> bags: (From spills, leaking containers or other sources)

Unreacted or partially reacted Drex-PH<sub>3</sub> bags are acutely hazardous. Improper disposal of this product is a violation of federal law. If this product cannot be disposed of by ordinary use or according to the instructions that follow, contact your state pesticide or environmental control agency or the hazardous waste representative at the nearest EPA regional office for guidance. Do not contaminate waste by disposal. Some local and state waste disposal regulations may vary from the following recommendations. Disposal procedures should be reviewed with appropriate authorities to ensure compliance with local regulations.

**Caution:** Wear a NIOSH/MSHA approved full-face gas mask – hydrogen phosphide canister combination if exposed to levels between 0.3 ppm to 15 ppm or a Self-Contained Breathing Apparatus (SCBA) if exposure is unknown or above 15 ppm must be worn during wet deactivation of partially spent material. Do not cover the container being used for wet deactivation.

Do not dispose of dust from bags of this product in a toilet.

## SPILL AND LEAK PROCEDURES

### Precautions And Directions:

A spill, other than incidental to application or normal handling, may produce high levels of gas and, therefore, attending personnel must wear SCBA or its equivalent when the concentration of phosphine 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 this product. Water in contact with unreacted bags will greatly accelerate the production of phosphine gas that could result in a toxic and/or fire hazard. Wear dry gloves of cotton or other material when handling aluminum phosphide.

Return all intact containers to fiberboard cases or other packaging which has been suitably constructed and marked according to DOT regulations. Notify consignee and shipper of damaged cases.

If containers have been punctured or damaged so as to leak, the container may be temporarily repaired with aluminum tape or this product may be transferred from the damaged container 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. Further instructions and directions may be obtained, if required, from Drexel Chemical Company.

If a spill has occurred which is only a few minutes old, collect the bags and place them back into the original container, if they are intact, close tightly. Place the collected bags in a sound metal container if the original containers are damaged. **Caution:** These containers may flash upon opening at some later time.

If the age of the spill is unknown or if the bags 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 to transport to a secure site for deactivation. Alternatively, small amounts of spillage may be spread out in an open area away from inhabited buildings to be deactivated by atmospheric moisture.

## DEACTIVATION PROCEDURES

The methods below may be used for deactivating used or unused Drex-PH<sub>3</sub> bags regardless of the extent to which the aluminum phosphide has decomposed.

### Dry Deactivation

Collect bags and place them into a well ventilated holding container such as wire cage or other similar devices. Store bags in one of these devices until the bags are spent. Unused or partially spent bags can be spread out on the ground in a secure open area away from occupied buildings to be deactivated by atmospheric moisture. Care should be taken so that they are not carried away by the wind. Dry deactivation is the recommended procedure for unused or partially spent bags.

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If in doubt, as to whether the bags are spent, contact Drexel Chemical Company.

Ignition may occur if large numbers of incompletely reacted bags are contacted by liquid water. This can occur in open or perforated storage containers. Therefore, such storage should be out of doors in a relative isolated area protected from rain.

### Wet Deactivation — Method One:

Fill an appropriate sized container with water a few inches from the top. Submerge bags for 36 hours. A metal grid works well to keep bags submerged. **Do not cover container.** Wear NIOSH/MSHA approved full-faced gas mask – hydrogen phosphide canister combination (if exposed to levels up to 15 ppm) or a Self-Contained Breathing Apparatus (SCBA) (if exposure is unknown or above 25 ppm). This should be done outdoors. The water may be disposed of in a storm sewer or by pouring it out on the ground.

### Wet Activation — Method Two:

Fill an appropriate sized metal container two-thirds full with water. For each gallon of water add one-fourth cup of low sudsing detergent or surfactant. Use no less than 1 gallon of water/detergent solution for 60 bags. Open each bag and dump contents into the container as the water is stirred. Wear a NIOSH/MSHA approved full face gas mask – hydrogen phosphide canister combination if exposed to levels up to 15 ppm) or a Self-Contained Breathing Apparatus (SCBA) (if exposure is unknown or above 25 ppm). **Do not cover container at any time.** This should be done outdoors.

## DISPOSAL PROCEDURES

In open areas, small amounts (up to 7 kg) of the spent bags may be disposed of on site by burial of the bags or by opening the bags and spreading the dust over the land surface away from inhabited buildings.

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

Do not dispose of dust in a toilet.

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

**Caution:** Wear a NIOSH/MSHA approved full-face gas mask — hydrogen phosphide canister combination if exposed to levels between 0.3 to 15 ppm or a Self-Contained Breathing Apparatus (SCBA) if exposure is unknown or above 15 ppm during wet deactivation of unexposed or incompletely exposed Drex-PH<sub>3</sub>.

Never place bags or dust in a closed container such as a dumpster, sealed drum, plastic bag, etc., as flammable concentrations and a flash of phosphine gas are likely to develop.

**FOR ASSISTANCE, CONTACT:** Drexel Chemical Company  
1700 Channel Ave.  
P.O. Box 13327  
Memphis, TN  
Tel: (901) 774-4370  
or

For Human or Animal Medical Emergencies:  
NPIC: 800-258-7378

For All Other Chemical Emergencies:  
CHEMTREC: 800-424-9300

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### WARRANTY—CONDITIONS OF SALE

OUR DIRECTIONS FOR USE of this product are based upon tests believed reliable. Follow directions carefully. Timing and method of application, weather and crop conditions, mixtures with other chemicals not specifically recommended and other influencing factors in the use of this product are beyond the control of the seller. To the extent consistent with applicable law, Buyer assumes all risks of use, storage and handling of this material not in strict accordance with directions given herewith.

To the extent consistent with applicable law, in no case shall the Manufacturer or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product when such use and/or handling is not in strict accordance with directions given herewith. The foregoing is a condition of sale by the Seller and is accepted as such by the Buyer.



Manufactured For:

**Drexel Chemical Company**

P.O. BOX 13327, MEMPHIS, TN 38113-0327

**SINCE 1972**