

2023-0778
23-03-07

(Insert Red Maple Leaf)

(DEGESCH LOGO)

**DEGESCH MAGTOXIN®
PREPAC SPOT FUMIGANT**

FOR SPOT TREATMENT OF PESTS IN FOOD
AND FEED PROCESSING MACHINERY AND EQUIPMENT

**READ THE ENTIRE LABEL, WHICH INCLUDES, THE APPLICATOR'S MANUAL AND GUIDANCE
FOR PREPARATION OF A FUMIGATION MANAGEMENT PLAN BEFORE USING.**

**THIS PRODUCT CAN ONLY BE USED IN CONJUNCTION WITH A DETAILED FUMIGATION
MANAGEMENT PLAN**

**A FUMIGATION MANAGEMENT PLAN MUST BE WRITTEN FOR ALL FUMIGATIONS PRIOR TO
ACTUAL TREATMENT**

IN FACILITIES THAT USE THIS PRODUCT, ALL EMPLOYEES MUST COMPLETE MANDATORY ANNUAL TRAINING ON THE HAZARDS OF THIS PRODUCT, THE USE OF SAFETY EQUIPMENT (I.E., RESPIRATORY PROTECTION AND PERSONAL MONITORS), AND THE EXPOSURE LIMIT OF 0.1 PPM. IT IS THE RESPONSIBILITY OF THE CERTIFIED/LICENSED APPLICATOR TO INFORM THE PERSON IN CHARGE OF THE FACILITY OR AGRICULTURAL ESTABLISHMENT, WHERE THE FUMIGATION WILL TAKE PLACE, OF THE REQUIREMENT FOR THE MANDATORY TRAINING.

RESTRICTED

DANGER (POISON SYMBOL) POISON

KEEP OUT OF REACH OF CHILDREN AND PREVENT ACCESS BY UNAUTHORIZED PERSONNEL

GUARANTEE: Magnesium Phosphide 66%

REGISTRATION NO. 26524 PEST CONTROL PRODUCTS ACT

**NET CONTENTS: 12 Pouches per Pail Containing
5 Interconnected Prepacs
Total: 60 Prepacs, Each containing 66 Magtoxin® Pellets
NET WEIGHT: 2.376kg**

**Manufactured for:
DEGESCH America, Inc.
153 Triangle Drive
P. O. Box 116
Weyers Cave, Virginia 24486 USA
Telephone: 540-234-9281/1-800-330-2525
Fax: 540-234-8225
Internet: www.degeschamerica.com
E-mail: degesch@degeschamerica.com**

**Canadian Agent:
DEGESCH CANADA
8685 Rue Lafrenaié
Saint-Leonard, QC
Canada H1P 2B6
Telephone: 514-852-3010**

NOTICE TO USER: This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *Pest Control Products Act* to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

NATURE OF RESTRICTIONS:

The use of this product is RESTRICTED due to the high acute inhalation toxicity of hydrogen phosphide (phosphine, PH₃) gas which is formed when this product is exposed to moisture in the air.

This product is for retail sale to and use only by individuals holding an appropriate pesticide applicator certificate or license recognized by the provincial/territorial pesticide regulatory agency where the pesticide application occurs or by persons trained in accordance with the Applicator's Manual working under the direct supervision and in the physical presence of an applicator holding an appropriate pesticide applicator certificate or license recognized by the provincial/territorial pesticide agency where the pesticide application occurs. Consult local pesticide regulatory authorities about use permits which may be required.

This product is accompanied by an approved label, an Applicator's Manual and Guidance for Preparation of a Fumigation Management Plan. **READ AND UNDERSTAND THE ENTIRE LABEL AND THE APPLICATOR'S MANUAL.** All parts of the label and manual are equally important for safe and effective use of this product. Call the manufacturer if you have any questions or do not understand any part of this label and the Applicator's Manual.

In facilities that use this product, all employees **MUST** complete mandatory annual training as outlined in the Applicator's Manual – **MANDATORY ANNUAL TRAINING**. Training includes information on the hazards of this product, the use of safety equipment (i.e., respiratory protection and personal monitors), and the exposure limit of 0.1 ppm. It is the responsibility of the certified/licensed applicator to inform person in charge of the facility or agricultural establishment, where the fumigation will take place, of the requirement for the mandatory training.

Appropriate respiratory protection **MUST** be worn at all times when levels of hydrogen phosphide gas are above 0.1 ppm, as outlined in the Applicator's Manual - **RESPIRATORY PROTECTION**. If hydrogen phosphide levels are unknown, appropriate respiratory protection, **OR** a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm, must be worn. If at any time hydrogen phosphide levels exceed 0.1 ppm, all individuals who are not wearing respiratory protection as outlined in Section 6 **MUST** vacate the area until hydrogen phosphide levels are at or below 0.1 ppm.

Entry by unprotected workers into the fumigated site is only permitted after the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. Only if necessary, should workers be present in the fumigation zone. All workers present in the fumigation zone during the fumigation or aeration periods **MUST** wear appropriate respiratory protection, as outlined in the Applicator's Manual – **RESPIRATORY PROTECTION**, **OR** a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm. Each unprotected worker in the fumigation zone must have a personal hydrogen phosphide monitor that is functional for the duration of the work period, must know how to operate the personal hydrogen phosphide monitor and be informed of procedures required if the air levels of hydrogen phosphide gas exceed 0.1 ppm.

A fumigation zone must be established for all fumigated sites (with the exception of ships and railcars that are in motion), refer to the Applicator's Manual – **FUMIGATION ZONE REQUIREMENTS**. Note that the term "fumigated site/application site" refers to the site under fumigation treatment. Placarding is required for both the fumigated site and the fumigation zone perimeter.

This product must be stored away from lodging for humans, animal quarters and normal work areas to avoid inadvertent exposure. Refer to the Applicator's Manual for detailed storage instructions.

RESTRICTED USES: Spot fumigation is the short-term treatment of food and feed processing machinery and equipment with toxic vapors for control of the adult and larval life stages of pests which infest food particles

remaining within the equipment. The minimum exposure time of 34 hours is not long enough to ensure destruction of pupae or eggs. In addition, much of the equipment to be treated is of loose or open construction and cannot readily be sealed. Other than in bins and tanks, it is not unusual for virtually all of the hydrogen phosphide gas to have leaked out in 24 hours or less. Since this type of treatment merely interrupts the life cycle of the pests, spot fumigations need to be performed at regular intervals, at intervals of one month or less, until the problem is brought under control.

Spot fumigations with **Magtoxin® Prepac Spot Fumigant** must not be conducted at temperatures below 5°C (40°F). The minimum duration of the spot fumigation is 34 hours. This exposure period serves not only to control the infestation, but also to allow ample time for reaction of the Prepac. Deactivation and disposal of **Magtoxin®** Prepacs that are only partially spent will require extra care and precautions. See recommendations given under DISPOSAL INSTRUCTIONS. Refer to the Applicator's Manual for detailed PRECAUTIONS, RECOMMENDATIONS AND DIRECTIONS FOR USE.

Under no circumstances shall any processed food, feed or bagged commodity come into direct contact with Magtoxin Prepac Spot Fumigant, or a raw agricultural commodity that will be used directly as a food without further processing.

This product is highly toxic to birds and mammals. Carefully inspect the outside and inside of the structure prior to application of the fumigant to ensure the absence of nesting or roosting birds. Avoid application if birds are present.

This product is not to be used for vacuum fumigations.

Hydrogen phosphide will corrode certain metals, especially at high concentrations and humidity levels. Protection or removal of wiring, sensitive equipment or precious metals is recommended under these conditions.

(RIGHT PANEL)

PRECAUTIONS:

Forms Extremely Hazardous Gas.

KEEP OUT OF REACH OF CHILDREN AND PREVENT ACCESS BY UNAUTHORIZED PERSONNEL.

Fatal if inhaled, swallowed or absorbed through eyes or skin.

DO NOT inhale gas or dust.

DO NOT ingest Magtoxin® Prepac Spot Fumigant or dust.

DO NOT get in eyes or on skin or clothing.

DO NOT eat, drink or smoke while handling Magtoxin® Prepac Spot Fumigant.

Exposure to moisture in the air or liquids releases flammable and toxic hydrogen phosphide (phosphine, PH₃) gas. Piling of Magtoxin® Prepac Spot Fumigant or the addition of liquid to the product is prohibited. Spontaneous ignition may result if contacted by liquids such as water, acids, or chemicals.

It is not necessary to wear gloves or other protective clothing when handling **Magtoxin® Prepac Spot Fumigant**. However, wear a loose fitting long sleeve shirt, long pants, socks and shoes, and dry gloves of cotton or other breathable material if contact with metal phosphide dust is likely. Wash hands thoroughly after handling magnesium phosphide products.

A fumigation zone must be established for all fumigated sites, as outlined in the Applicator's Manual – FUMIGATION ZONE REQUIREMENTS, and the table below.

SITE	Minimum Distance of Fumigation Zone	
	Fumigation Period	Aeration Period
Indoor Application Sites	10 metres OR all workers inside the facility MUST wear a personal hydrogen phosphide monitor.	Fumigation zone determined by licensed/certified applicator
Outdoor Application Sites	Fumigation zone determined by licensed/certified applicator	

Entry by unprotected workers into the fumigated site is only permitted after the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. Only if necessary, should workers be present in the fumigation zone. All workers present in the fumigation zone during the fumigation or aeration periods MUST wear appropriate respiratory protection, as outlined in the Applicator's Manual – RESPIRATORY PROTECTION, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm. Each unprotected worker in the fumigation zone must have a personal hydrogen phosphide monitor that is functional for the duration of the work period, must know how to operate the personal hydrogen phosphide monitor and be informed of procedures required if the air levels of hydrogen phosphide gas exceed 0.1 ppm. If at any time hydrogen phosphide levels exceed 0.1 ppm, all individuals who are not wearing respiratory protection as outlined in Section 6 MUST vacate the area until hydrogen phosphide levels are at or below 0.1 ppm.

Appropriate respiratory protection MUST be worn at all times when levels of hydrogen phosphide are above 0.1 ppm, as outlined below and in the Applicator's Manual – RESPIRATORY PROTECTION. If hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn. If a beard or long sideburns interfere with the fit of respiratory protection, they must be shaven.

Required Respiratory Equipment

Phosphine Level (PPM)	Minimum Required Respiratory Equipment
Unknown or <0.1 ppm	Personal hydrogen phosphide monitor or respiratory equipment required for phosphine levels greater than 5 ppm.
>0.1 <5 ppm	NIOSH-approved air-purifying, full face respirator (gas mask) with a chin-style, front- or back-mounted canister approved for hydrogen phosphide OR a NIOSH-approved supplied-air respirator (i.e., air-line respirator or self-contained breathing apparatus) with a full face piece.
>5 ppm	NIOSH-approved self-contained breathing apparatus with a full face piece operated in a pressure-demand or other positive-pressure mode OR a NIOSH-approved air-line respirator with a full face piece operated in a pressure-demand or other positive-pressure mode combined with an auxiliary self-contained positive-pressure breathing apparatus.

When opening the product canister, point the canister away from the face and body and slowly loosen the cap. Although the chances for a flash are very remote, never open these containers in a flammable atmosphere.

Theft of products: Immediately report to the local police department thefts of metal phosphide fumigants. Registrant must be informed of any incident involving the use of this product.

ENVIRONMENTAL HAZARDS:

Toxic to birds and mammals. Carefully inspect the outside and inside of the structure prior to application of the fumigant to ensure the absence of nesting or roosting birds. Avoid application if birds are present.

DO NOT contaminate irrigation or drinking water supplies or aquatic habitats such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands by cleaning of equipment or disposal of wastes.

DISPOSAL:

Refer to the Disposal instructions of the Applicator's Manual for proper disposal of used Magtoxin® Prepac Spot Fumigant after fumigation is completed. Open dumping is prohibited. Do not discharge this product, or material containing this product, into natural waterways, wetlands (swamps, bogs, marshes, potholes, etc.) or municipal wastewater collection systems. Do not contaminate water, food or feed by disposal. Proper disposal of magnesium phosphide is required to ensure minimal impact on the environment. See the Applicator's Manual for additional disposal instructions.

TOXICOLOGICAL INFORMATION:

MAGTOXIN® PREPAC SPOT FUMIGANT containing magnesium phosphide reacts with moisture from the air, acids and many other liquids to release hydrogen phosphide (phosphine, PH₃) gas. Mild exposure by inhalation may cause 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 may cause weakness, vomiting, pain just above the stomach, chest pain, diarrhea and dyspnea (difficulty in breathing). Symptoms of severe poisoning may occur within a few hours to several days. Severe poisoning may result in pulmonary edema (fluid in lungs) and may lead to dizziness, cyanosis (blue or purple skin colour), unconsciousness, and death. In sufficient quantity, hydrogen phosphide affects the liver, kidneys, lungs, nervous system and circulatory system, and may result in (1) pulmonary edema, (2) liver elevated serum AST, ALT and ALP, reduced prothrombin, hemorrhage and jaundice (yellow skin colour) and (3) kidney haematuria (blood in urine) and anuria (abnormal or lack of urination). Pathology is characteristic of hypoxia (oxygen deficiency in body tissue). Frequent exposure to concentrations above permissible levels over a period of days or weeks may cause poisoning. Inhalation can cause lung edema (fluid in lungs) and hyperaemia (excess of blood in a body part), small perivascular brain hemorrhages and brain edema (fluid in brain). Poisonous if swallowed. Ingestion can cause lung and brain symptoms but damage to the viscera (body cavity organs) is more common.

Treatment is symptomatic. The following measures are suggested for use by the physician in accordance with his/her own judgment:

In its milder to moderate forms, symptoms of poisoning may take up to 24 hours to appear. Monitoring should continue for at least this long. Manifestations of severe poisoning appear early. Hypoxia and hypotension should be treated with usual supportive measures of oxygenation, intubation, ventilation and positive pressure as needed, and intravenous fluids, pressors and inotropes as required, respectively. In the event of the ingestion of a large quantity of magnesium phosphide, once the patient is stabilized, aspiration of gastric contents by inserting a 16 french naso-gastric tube to suction the stomach contents might be considered. There is no specific antidote. Hemodialysis may be indicated if renal failure develops but does not remove the toxin.

FIRST AID:

Symptoms of exposure to hydrogen phosphide gas-releasing products can include headache, dizziness, nausea, difficult breathing, vomiting, and diarrhea. In all cases of exposure, protect yourself, remove the person from the source of exposure and get them to an Emergency department. If possible, bring this Applicator's Manual, the container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

FIRST AID RESPONDER PROTECTION: Hydrogen phosphide gas is a highly toxic systemic poison and a severe respiratory tract irritant. Persons exposed to solid phosphides, which react with moisture to produce hydrogen phosphide gas, can pose risks to others if phosphides are on clothes, skin, or hair. First Aid responders should protect themselves through the use of appropriate personal protective equipment before attempting to rescue or care for a person who has been exposed to a hydrogen phosphide gas-releasing product, and/or if entering a zone with potentially unsafe hydrogen phosphide levels. A NIOSH-approved self-contained breathing apparatus (SCBA) with a full face piece operated in a pressure-demand or other positive-pressure mode OR a NIOSH-approved air-line respirator with a full face piece operated in a pressure-demand or other positive-pressure mode combined with an auxiliary self-contained positive-pressure breathing apparatus is recommended in response situations that involve exposure to potentially unsafe or unknown levels of hydrogen phosphide (see the PRECAUTIONS and SAFETY RECOMMENDATIONS sections of product label or Applicator's Manual for further guidance regarding personal protective equipment).

IF INHALED: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration using a bag-valve-mask device to prevent possible secondary exposure to hydrogen phosphide gas to the first aid responder. Do not perform mouth-to-mouth resuscitation. Do not give anything by mouth to an unconscious person. Call a poison control centre or doctor

immediately for further treatment advice.

IF SWALLOWED: Call a poison control centre or doctor immediately for treatment advice. **DO NOT DRINK WATER.** Do not administer anything by mouth or make the person vomit. It is likely that this exposure will lead to spontaneous vomiting.

IF ON SKIN OR CLOTHING: Brush or shake material off clothes and shoes in a well-ventilated area. Allow clothes to aerate in a ventilated area prior to laundering. Do not leave contaminated clothing in occupied and/or confined areas such as automobiles, vans, motel rooms, etc. Wash contaminated skin thoroughly with soap and water for 15-20 minutes. Call a poison control centre or doctor for further treatment advice.

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.

HOT LINE NUMBER

Have the product container label or Applicator's Manual with you when calling a poison control centre, doctor, or when going for treatment. **CONTACT 1-800-308-4856 FOR ASSISTANCE WITH HUMAN OR ANIMAL MEDICAL EMERGENCIES.** You may also contact Degesch America, Inc. 540-234-9281/ 1-800-330-2525 or, DEGESCH CANADA 514-852-3010. For all other chemical emergencies, please contact CHEMTREC – 1-800-424-9300 or Canadian Transport Emergency Centre (CANUTEC) 613-996-6666.

PEST MANAGEMENT PRACTICES

An operational pest management plan must be put in place in food processing facilities and/or other relevant sites where insects/rodents forage or seek refuge in order that the facility, its equipment and its exterior surroundings do not promote pest populations, and are amenable to control and treatment methods. The plan should include the following:

- Practices to reduce or eliminate infestations in incoming food and ingredients through strict purchase specifications, audits of supplies, and inspection of incoming material.
- Good sanitation practices involving thorough and regular cleaning, prevention of dust generation and accumulation, and removal of food sources and harbourages for pests.
- Building maintenance to eliminate holes and cracks in floors, walls, ceilings, roofs, doors and windows that allow access for pests.
- Regular inspections and monitoring to guide schedules and locations of treatments, and to monitor the effectiveness of the overall management strategy.
- Pest identification and understanding of each pest's lifecycle to select the most appropriate control methods.
- Other practices including physical and mechanical treatments, controlled atmospheres, and applications of registered pesticides. Each treatment should be used as one component of an overall pest management plan. All pesticides must be stored, handled, and used according to label instructions.

(Insert Red Leaf)

FOR

DEGESCH MAGTOXIN® PREPAC SPOT FUMIGANT

FOR SPOT TREATMENT OF PESTS IN FOOD AND FEED
PROCESSING MACHINERY AND EQUIPMENT

READ THE ENTIRE LABEL, WHICH INCLUDES, THE APPLICATOR'S MANUAL AND GUIDANCE FOR
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THIS PRODUCT CAN ONLY BE USED IN CONJUNCTION WITH A DETAILED FUMIGATION MANAGEMENT PLAN

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ACTUAL TREATMENT**

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RESTRICTED

DANGER (Insert DANGER/POISON symbol) POISON

KEEP OUT OF REACH OF CHILDREN AND PREVENT ACCESS BY UNAUTHORIZED PERSONNEL

GUARANTEE: Magnesium Phosphide 66%

REGISTRATION NO. 26524 PEST CONTROL PRODUCTS ACT

Manufactured for:

DEGESCH AMERICA, INC.
153 TRIANGLE DRIVE
P. O. BOX 116
WEYERS CAVE, VA 24486 USA
TELEPHONE: 540-234-9281/1-800-330-2525
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TELEPHONE: 514-852-3010

FORM 30358 (1/2023)

(inside front cover)

THIS PRODUCT IS ACCOMPANIED BY AN APPROVED LABEL, WHICH INCLUDES, THE APPLICATOR'S MANUAL AND

GUIDANCE FOR PREPARATION OF A FUMIGATION MANAGEMENT PLAN. READ AND UNDERSTAND THE ENTIRE LABEL AND THE APPLICATOR'S MANUAL. ALL PARTS OF THE LABEL AND MANUAL ARE EQUALLY IMPORTANT FOR SAFE AND EFFECTIVE USE OF THIS PRODUCT. CALL THE MANUFACTURER IF YOU HAVE ANY QUESTIONS OR DO NOT UNDERSTAND ANY PART OF THIS LABEL AND THE APPLICATOR'S MANUAL.

REFER TO THIS APPLICATOR'S MANUAL FOR DETAILED PRECAUTIONS, SAFETY RECOMMENDATIONS AND DIRECTIONS FOR USE.

MAGNESIUM PHOSPHIDE PELLETS ARE NONCOMBUSTIBLE, BUT EXPOSURE TO MOISTURE IN THE AIR OR WATER RELEASES FLAMMABLE AND TOXIC PHOSPHINE (HYDROGEN PHOSPHIDE) GAS. SPONTANEOUS IGNITION MAY RESULT IF CONTACTED BY WATER, ACIDS, OR OTHER LIQUIDS.

HYDROGEN PHOSPHIDE-AIR MIXTURES AT CONCENTRATIONS ABOVE THE LOWER FLAMMABLE LIMIT MAY IGNITE SPONTANEOUSLY. IGNITION OF HIGH CONCENTRATIONS OF HYDROGEN PHOSPHIDE CAN PRODUCE A VERY ENERGETIC REACTION. EXPLOSIONS CAN OCCUR UNDER THESE CONDITIONS AND MAY CAUSE SEVERE PERSONAL INJURY. **NEVER ALLOW THE BUILD-UP OF HYDROGEN PHOSPHIDE TO EXCEED EXPLOSIVE CONDITIONS.** DO NOT CONFINE SPENT OR PARTIALLY SPENT DUST FROM METAL PHOSPHIDE FUMIGANTS, AS THE SLOW RELEASE OF HYDROGEN PHOSPHIDE FROM THIS MATERIAL MAY RESULT IN THE FORMATION OF AN EXPLOSIVE ATMOSPHERE.

NOTICE TO USER: This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *Pest Control Products Act* to use this product in any way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this

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This product must be stored away from lodging for humans, animal quarters and normal work areas to avoid inadvertent exposure. Refer to the Applicator's Manual for detailed storage instructions.

RESTRICTED USES: Spot fumigation is the short-term treatment of food and feed processing machinery and equipment with toxic vapors for control of the adult and larval life stages of pests, which infest food particles remaining within the equipment. The minimum exposure time of 34 hours is not long enough to ensure destruction of pupae or eggs. In addition, much of the equipment to be treated is of loose or open construction and cannot readily be sealed. Other than in bins and tanks, it is not unusual for virtually all of the hydrogen phosphide gas to have leaked out in 24 hours or less. Since this type of treatment merely interrupts the life cycle of the pests, spot fumigations need to be performed at regular intervals, at intervals of one month or less, until the problem is brought under control.

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“Disposal Instruction”. Refer to the Applicator’s Manual for detailed Precautions, Recommendations and Directions for Use.

The licensed/certified applicator is only required to be present until the air concentrations of hydrogen phosphide gas are at or below the exposure limit of 0.1 ppm as outlined in FUMIGATION ZONE REQUIREMENTS.

Under no circumstances shall any processed food, feed or bagged commodity come into direct contact with **Magtoxin® Prepac Spot Fumigant**, or a raw agricultural commodity that will be used directly as a food without further processing.

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15.1 **General Precautions**.....

15.2 **Spills & Leaks in Dry, Non-Wet Areas**.....

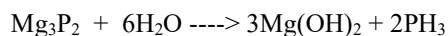
15.3 **Deactivation of Magtoxin® Prepac Spot Fumigant by the Wet Method**.....

15.4 **Spills Into Water**.....

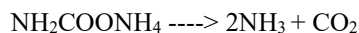
1. INTRODUCTION

Magnesium phosphide fumigants are used to protect stored commodities from damage by pests. However, the **Magtoxin® Prepac Spot Fumigant** has been specially manufactured for the treatment of food and feed processing machinery and equipment to control insect infestations arising inside this equipment and machinery. Spot fumigation may be defined as the short-term treatment of processing machinery and equipment with toxic vapors for control of the adult and larval life stages of pests, which infest food and feed particles remaining within the equipment and machinery. These spot treatments are intended to interrupt the life cycles of the pests. Since one or more life stages may survive this short-term treatment, spot fumigations must be repeated periodically to control insect infestation.

Magnesium phosphide and other metal phosphide fumigants are acted upon by atmospheric moisture to produce hydrogen phosphide (phosphine, PH₃) gas. **Magtoxin® Prepac Spot Fumigant** contains magnesium phosphide (Mg₃P₂) as its active ingredient and will liberate hydrogen phosphide via the following chemical reaction:



Hydrogen phosphide gas is highly toxic to insects, 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. **Magtoxin® Prepac Spot Fumigant** also contains ammonium carbamate, which liberates ammonia and carbon dioxide as follows:



These gases are essentially non-flammable and acting as inert agents to reduce fire hazards. The ammonia gas also serves as a warning agent.

The **Magtoxin® Prepac Spot Fumigant** consists of a gas-permeable blister pack of **Magtoxin®** pellets. Each **Magtoxin® Prepac Spot Fumigant** strip is roughly 10 cm x 40 cm (4-1/4" x 16") and contains 33 blisters, each blister containing 2 pellets for a total of 66 pellets per strip. **Magtoxin®** pellets weigh approximately 0.6g each and release 0.2g of hydrogen phosphide gas. Each **Magtoxin® Prepac** then will release 13.2 of hydrogen phosphide. The strips are connected end-to-end, 5 **Prepac** strips in a row, and sealed into gas-tight aluminum foil pouches. The pouches are packed into covered metal pails, 12 pouches or 60 **Magtoxin® Prepacs** per pail. Each pail contains 3960 **Magtoxin®** pellets, which weigh a total of 2376g and will liberate 792g of hydrogen phosphide gas. The pails are constructed to conform to T.D.G.A. Specifications; Steel Drums, UN1A2/X21.3/5.

Upon opening the aluminum foil pouch, atmospheric moisture penetrates the porous fleece material on the top and bottom of the **Magtoxin® Prepac**. The **Magtoxin®** pellets then begin to react to produce small quantities of hydrogen phosphide gas, which diffuses out through the fleece into the surrounding space. This reaction starts slowly, gradually accelerates and then tapers off as the magnesium phosphide is spent. The rate of decomposition of the **Magtoxin® Prepac** will vary depending upon moisture and temperature conditions. For example, when moisture and temperature are high, decomposition of **Magtoxin® Prepacs** may be complete in less than 10 hours. However, at lower ambient temperatures and relative humidity levels, decomposition may require 4 days or more.

After decomposition of the **Magtoxin®** pellets, a dark gray powder composed almost entirely of magnesium hydroxide and other approved inert ingredients remains. This powder will be retained inside the fleece of the **Prepac** strip and may be retrieved after fumigation so as not to contaminate the treated commodity. **The spent Magtoxin® Prepac must not be allowed to contaminate the processed food or feed.** Therefore, it must be retrieved after fumigation prior to starting up the processing line unless the spot fumigant has been applied to a fumiport or in some other fashion so as to ensure that it is retained and will not enter the food or feed stream. If properly exposed, the spent **Magtoxin® Prepac** will normally contain only a small amount of unreacted magnesium phosphide and may be disposed of without hazard. This is not considered a hazardous waste. However, partially spent residual from incompletely exposed **Magtoxin® Prepacs** will require special care. Precautions and instructions for further deactivation and disposal will be given later in the Applicator's Manual.

Magtoxin® Prepacs are supplied in gas-tight foil pouches, and their shelf life is unlimited as long as the packaging remains intact. Once pouches are opened for fumigation, the entire contents of the aluminum foil pouch must be used following label as it cannot be resealed. Storage and handling instructions will be given in detail later in the Applicators Manual.

SAFETY RECOMMENDATIONS SUMMARY

1. Carefully read the label and Applicator's Manual and follow instructions explicitly.
2. Licensed/certified applicator must develop and follow a Fumigation Management Plan and notify appropriate company employees prior to fumigation. Provide to local officials (fire department, rescue squad, police, etc.) relevant safety information for use in the event of an emergency.

3. Never fumigate alone from inside the structure. At least two persons, a licensed/certified applicator and trained person, or two persons trained in accordance with the Applicator's Manual working under the direct supervision of the licensed/certified applicator must be present during fumigation of structures when entry into the structure for application of the fumigant is required. Appropriate respiratory protection, as outlined in Section 6, RESPIRATORY PROTECTION, MUST be worn at all times when levels of hydrogen phosphide gas are above 0.1 ppm. If hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn. If at any time hydrogen phosphide levels exceed 0.1 ppm, all individuals who are not wearing respiratory protection as outlined in Section 6 MUST vacate the area until hydrogen phosphide levels are at or below 0.1 ppm.
4. Observe all Provincial pesticide legislation requirements.
5. The licensed/certified applicator must maintain visual and/or voice contact with all fumigation workers during the application of the fumigants.
6. Wear a loose fitting long sleeve shirt, long pants, socks and shoes, and wear dry gloves of cotton or other breathable material if contact with dust or pellets from Prepac is likely. Aerate used gloves and other contaminated clothing in a well-ventilated area prior to laundering. Wash hands thoroughly after using magnesium phosphide products.
7. A fumigation zone must be established for all fumigated sites as per the instructions outlined under Section 7, FUMIGATION ZONE REQUIREMENTS.
8. Post warning placards around both the fumigated site and the fumigation zone perimeter as per instructions in Section 10, PLACARDING OF FUMIGATION AREAS.
9. Entry by unprotected workers into the fumigated site is only permitted after the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. Only if necessary, should workers be present in the fumigation zone. All workers present in the fumigation zone during the fumigation or aeration periods MUST wear appropriate respiratory protection, as outlined in the Applicator's Manual – RESPIRATORY PROTECTION, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm. Each unprotected worker in the fumigation zone must have a personal hydrogen phosphide monitor that is functional for the duration of the work period, must know how to operate the personal hydrogen phosphide monitor and be informed of procedures required if the air levels of hydrogen phosphide gas exceed 0.1 ppm.
10. Exposure to hydrogen phosphide must never exceed 0.1 ppm. If workers must handle incompletely aerated commodity, or are indoors (e.g., an enclosed elevator head) they must wear appropriate respiratory protection (see Section 6, RESPIRATORY PROTECTION).
11. Keep containers of **Magtoxin®** Prepac Spot Fumigant tightly closed except while removing product for application. Never open fumigant containers in a flammable atmosphere. It is preferable to open them in open air, near a fan or other appropriate ventilation which will rapidly exhaust contaminated air.
12. Piling of Prepac or the addition of liquid to the product is prohibited.
13. Dispose of empty containers and spent residual dust in a manner consistent with the label instructions.
14. Hydrogen phosphide fumigants are **not** to be used for vacuum fumigations.
15. Hydrogen phosphide will corrode copper and precious metals at high concentrations or humidity levels. Protection or removal of wiring, sensitive equipment or precious metals is recommended under these conditions.
16. Under no circumstances shall any processed food, feed or bagged commodity come into direct contact with **Magtoxin®** Prepac, pellets or residual dust, or a raw agricultural commodity that will be used directly as a food without further processing
17. Do not use magnesium phosphide containers for any purpose other than recycling or reconditioning.
18. Pre-exposure screening of employees to detect impaired pulmonary function is recommended. Any employees developing this condition should be referred for medical examination.
19. Theft of products: Immediately report to the local police department thefts of metal phosphide fumigants.
20. Registrant must be informed of any incident involving the use of this product.

2. **FIRST AID**

Symptoms of exposure to hydrogen phosphide gas-releasing products can include headache, dizziness, nausea, difficult breathing, vomiting, and diarrhea. In all cases of exposure, protect yourself, remove the person from the source of exposure and get them to an Emergency department. If possible, bring this Applicator's Manual, the container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

FIRST AID RESPONDER PROTECTION: Hydrogen phosphide gas is a highly toxic systemic poison and a severe respiratory tract irritant. Persons exposed to solid phosphides, which react with moisture to produce hydrogen phosphide gas, can pose risks to others if phosphides are on clothes, skin, or hair. First Aid responders should protect themselves through the use of appropriate personal protective equipment before attempting to rescue or care for a person who has been exposed to a hydrogen phosphide gas-releasing product, and/or if entering a zone with potentially unsafe hydrogen phosphide levels. A NIOSH-approved self-contained breathing apparatus (SCBA) with a full face piece operated in a pressure-demand or other positive-pressure mode OR a NIOSH-approved air-line respirator with a full face piece operated in a pressure-demand or other positive-pressure mode combined with an auxiliary self-contained positive-pressure breathing apparatus is

recommended in response situations that involve exposure to potentially unsafe or unknown levels of hydrogen phosphide (see Section 4, PRECAUTIONS, of product label or Applicator's Manual for further guidance regarding personal protective equipment.)

IF INHALED: Move person to fresh air. If person is not breathing, call 911 or an ambulance, and then give artificial respiration using a bag-valve-mask device to prevent possible secondary exposure to hydrogen phosphide gas to the first aid responder. Do not perform mouth-to-mouth resuscitation. Do not give anything by mouth to an unconscious person. Call a poison control centre or doctor immediately for further treatment advice.

IF SWALLOWED: Call a poison control centre or doctor immediately for treatment advice. **DO NOT DRINK WATER.** Do not administer anything by mouth or make the person vomit. It is likely that this exposure will lead to spontaneous vomiting.

IF ON SKIN OR CLOTHING: Brush or shake material off clothes and shoes in a well-ventilated area. Allow clothes to aerate in a ventilated area prior to laundering. Do not leave contaminated clothing in occupied and/or confined areas such as automobiles, vans, motel rooms, etc. Wash contaminated skin thoroughly with soap and water for 15-20 minutes. Call a poison control centre or doctor for further treatment advice.

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.

HOT LINE NUMBER

Have the product container label or Applicator's Manual with you when calling a poison control centre, doctor, or when going for treatment. **CONTACT 1-800-308-4856 FOR ASSISTANCE WITH HUMAN OR ANIMAL MEDICAL EMERGENCIES.** You may also contact DEGESCH AMERICA, INC. 540-234-9281/1-800-330-2525 or DEGESCH CANADA 514-852-3010 For all other chemical emergencies, please contact CHEMTREC – 1-800-424-9300 or Canadian Transport Emergency Centre (CANUTEC) 613-996-6666.

3. TOXICOLOGICAL INFORMATION

DEGESCH **Magtoxin® Prepac Spot Fumigant** will react with moisture from the air, acids and many other liquids to release hydrogen phosphide (phosphine, PH₃) 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, pain just above the stomach, chest pain, diarrhea and dyspnea (difficulty in breathing).

Symptoms of severe poisoning may appear within a few hours to several days. Severe poisoning may result in pulmonary edema (fluid in lungs) and may lead to dizziness, cyanosis (blue or purple skin colour), unconsciousness, and death.

In sufficient quantity, hydrogen phosphide affects the liver, kidneys, lungs, nervous system and circulatory system and may result in (1) pulmonary edema, (2) liver elevated serum AST, ALT and AIP, reduced prothrombin, hemorrhage and jaundice (yellow skin colour) and (3) kidney haematuria (blood in urine) and anuria (abnormal or lack of urination). Pathology is characteristic of hypoxia (oxygen deficiency in body tissue). Frequent exposure to concentrations above permissible levels over a period of days or weeks may cause poisoning. Inhalation can cause lung edema (fluid in lungs) and hyperaemia (excess of blood in a body part), small perivascular brain hemorrhages and brain edema (fluid in brain). Poisonous if swallowed. Ingestion can cause lung and brain symptoms, but damage to the viscera (body cavity organs) is more common.

Treatment is symptomatic. The following measures are suggested for use by the physician in accordance with his/her own judgement:

In its milder to moderate forms, symptoms of poisoning may take up to 24 hours to appear. Monitoring should continue for at least this long. Manifestations of severe poisoning appear early. Hypoxia and hypotension should be treated with usual supportive measures of oxygenation, intubation, ventilation and positive pressure as needed, and intravenous fluids, pressors and inotropes as required, respectively. In the event of the ingestion of a large quantity of magnesium phosphide, once the patient is stabilized, aspiration of gastric contents by inserting a 16 french naso-gastric tube to suction the stomach contents might be considered. There is no specific antidote. Hemodialysis may be indicated if renal failure develops but does not remove the toxin.

4. PRECAUTIONS

4.1 **DANGER: Hazardous to Humans, Birds and Mammals – KEEP OUT OF REACH OF CHILDREN AND PREVENT ACCESS BY UNAUTHORIZED PERSONNEL**

Magnesium phosphide from **Magtoxin® Prepac Spot Fumigant** is fatal if swallowed. **DO NOT** ingest pellets or dust. Magnesium phosphide forms extremely hazardous gas that is fatal if inhaled. **DO NOT** inhale/breathe gas. Fatal if absorbed through eyes or skin. **DO NOT** get in eyes, on skin or on clothing. **DO NOT** eat, drink or smoke while handling magnesium phosphide fumigants. If a sealed container is opened, or if the material comes into contact with water, acids or other liquids these products will release hydrogen phosphide (phosphine, PH₃) which is

an extremely toxic gas. If a garlic odour is detected, refer to the information on Industrial Hygiene Monitoring (Section 8.6) of this Applicator's Manual for appropriate monitoring procedures. Pure hydrogen phosphide gas is odourless; the garlic odour is due to a contaminant.

Since the odour of hydrogen phosphide may not be detected under some circumstances, the absence of a garlic odour does not mean that dangerous levels of hydrogen phosphide gas are absent. Observe proper entry procedures specified elsewhere in the labelling to prevent overexposure. In situations where ventilation of buildings is required following fumigation (e.g. warehouses), hydrogen phosphide gas may pose a potential hazard to small birds (e.g. swallows) nesting or roosting on or near those structures. Therefore, carefully inspect the outside of the structure prior to application of the fumigant to ensure the absence of nesting or roosting birds.

4.2 **Physical and Chemical Hazards**

Magnesium phosphide in Prepacs, pellets and partially spent dust will release hydrogen phosphide gas if exposed to moisture from the air or if it comes into contact with water, acids and many other liquids. Magnesium phosphide is considerably more reactive than aluminum phosphide and will liberate gas more rapidly. This is particularly true in the presence of liquid water and at higher temperatures. Since hydrogen phosphide 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 hydrogen phosphide can produce a very energetic reaction. Explosions can occur under these conditions and may cause severe personal injury. **Never allow the build-up of hydrogen phosphide to exceed explosive concentrations.** Do not confine spent or partially spent metal phosphide fumigants as the slow release of hydrogen phosphide from these materials may result in formation of an explosive atmosphere. Piling of Prepacs or the addition of liquid to the product is prohibited. This may cause a temperature increase, increase the rate of gas production and confine the gas so that ignition could occur.

It is preferable to open containers of magnesium 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 which will rapidly exhaust contaminated air. When opening pouches of **Magtoxin® Prepac Spot Fumigant**, point the pouch away from the face and body and slowly loosen the cap. 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 hydrogen phosphide.

Pure hydrogen phosphide (phosphine) gas is practically insoluble in water, fats and oils, and is stable at normal fumigation temperatures. However, hydrogen phosphide will corrode copper and precious metals at high concentrations or humidity levels. Protection or removal of wiring, sensitive equipment or precious metals is recommended under these conditions. 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. Hydrogen phosphide will also react with certain metallic salts and, therefore, sensitive items such as photographic film, some inorganic pigments, etc., should not be exposed.

4.3 **Environmental Hazards**

Toxic to birds and mammals. Carefully inspect the outside and inside of a structure prior to application of the fumigant to ensure the absence of nesting or roosting birds. Avoid application if birds are present. **DO NOT** contaminate irrigation or drinking water supplies or aquatic habitats such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands by cleaning of equipment or disposal of wastes.

5. **PROTECTIVE CLOTHING**

Wear a loose fitting long sleeve shirt, long pants, socks and shoes, and wear dry gloves of cotton or other breathable material if contact with dust or pellets from **Magtoxin® Prepac Spot Fumigant** is likely. After fumigation activities, remove all protective clothing, check and ensure that there is no magnesium phosphide product trapped inside clothing, aerate in a well-ventilated area then wash thoroughly, separately, before re-use.

If **Magtoxin®** pellets or dust become trapped inside clothing, remove affected clothing, place the collected trapped magnesium phosphide product in a sealable clean and dry plastic bag, store in a place that is inaccessible to any unauthorized personnel; and then wash hands and exposed skin thoroughly, shower and change into clean clothing. As much as possible, continue wearing the appropriate respiratory protection while handling the pellets or dust.

6. **RESPIRATORY PROTECTION**

Entry by unprotected workers into the fumigated site is only permitted after the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. Only if necessary, should

workers be present in the fumigation zone. All workers present in the fumigation zone during the fumigation or aeration periods MUST wear appropriate respiratory protection, as outlined below, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm. Each unprotected worker in the fumigation zone must have a personal hydrogen phosphide monitor that is functional for the duration of the work period, must know how to operate the personal hydrogen phosphide monitor and be informed of procedures required if the air levels of hydrogen phosphide gas exceed 0.1 ppm. NIOSH-approved respiratory protection must be worn if worker exposure limits cannot be met through engineering controls (such as forced air ventilation) and/or appropriate worker practices.

Appropriate respiratory protection MUST be worn at all times when levels of hydrogen phosphide are above 0.1 ppm, which may occur during delivery/dispensing of product, while attending to spills and leaks, during deactivation of unreacted product and while monitoring hydrogen phosphide levels during the fumigation and aeration periods. If hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn. Observe all Provincial pesticide legislation requirements. The respiratory protection must fit properly, any obstruction to a proper fit should be removed (e.g. beard, long sideburns).

For hydrogen phosphide levels between 0.1 – 5 ppm, the minimum protection required is a NIOSH-approved air-purifying, full face respirator (gas mask) with a chin-style, front- or back-mounted canister approved for hydrogen phosphide OR a NIOSH-approved supplied-air respirator (i.e., air-line respirator or self-contained breathing apparatus) with a full face piece.

For hydrogen phosphide levels above 5 ppm or at unknown concentrations, a NIOSH-approved self-contained breathing apparatus with a full face piece operated in a pressure-demand or other positive-pressure mode OR a NIOSH-approved air-line respirator with a full face piece operated in a pressure-demand or other positive-pressure mode combined with an auxiliary self-contained positive-pressure breathing apparatus must be worn.

For emergency use and/or to escape from conditions which are Immediately Dangerous to Life or Health (IDLH), keep available for use an adequate number of NIOSH-approved self-contained breathing apparatus with a full face piece operated in a pressure-demand or other positive-pressure mode.

Appropriate respiratory equipment is summarized in Table 6.0.

Table 6.0: Required Respiratory Equipment

Phosphine Level (PPM)	Minimum Required Respiratory Equipment
Unknown or <0.1 ppm	Personal hydrogen phosphide monitor or respiratory equipment required for phosphine levels greater than 5 ppm.
>0.1 <5 ppm	NIOSH-approved air-purifying, full face respirator (gas mask) with a chin-style, front- or back-mounted canister approved for hydrogen phosphide OR a NIOSH-approved supplied-air respirator (i.e., air-line respirator or self-contained breathing apparatus) with a full face piece.
>5 ppm	NIOSH-approved self-contained breathing apparatus with a full face piece operated in a pressure-demand or other positive-pressure mode OR a NIOSH-approved air-line respirator with a full face piece operated in a pressure-demand or other positive-pressure mode combined with an auxiliary self-contained positive-pressure breathing apparatus.
Emergency use or Immediately Dangerous to Life or Health Conditions	NIOSH-approved self-contained breathing apparatus with a full face piece operated in a pressure-demand or other positive-pressure mode.

When required, gas concentration measurements for safety purposes may be made using low level detector tubes or electronic metering devices*. See Section 9, APPLICATOR AND WORKER EXPOSURE, for monitoring requirements.

*Information on hydrogen phosphide (phosphine, PH₃) detector tubes or electronic metering devices may be obtained from your distributor.

7. FUMIGATION ZONE REQUIREMENTS

7.1 Fumigation Zones

A fumigation zone is an area established around the perimeter of the application site (fumigated site) where a hydrogen phosphide gas-releasing fumigant is applied. A fumigation zone must be established according to the distances listed in **Section 7.2 Minimum Distance of Fumigation Zone** during the fumigation period (i.e., from the beginning of the fumigant application until the beginning of aeration). During aeration (i.e., from the beginning of aeration until the hydrogen phosphide level is at or below 0.1 ppm), the fumigation zone is determined by the licensed/certified applicator who **MUST** be present for the duration of the aeration period.

The following describes the general fumigation zone requirements:

- A fumigation zone must be established according to the distances listed in **Section 7.2 Minimum Distance of Fumigation Zone**.
- The fumigation zone must be periodically monitored (i.e., according to a schedule made by the licensed/certified applicator as per site characteristics and environmental conditions). If at any point the hydrogen phosphide level is greater than 0.1 ppm, the provisions in **Section 7.3 Extension of Fumigation Zone As A Result of Monitoring** must be followed.
- The fumigation zone must be maintained until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone.
- Individuals must be excluded from the fumigation zone to the extent possible. If entry into the fumigation zone is required at any point from the beginning of application until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone, the provisions in the **Section 7.4 Authorized Entry into Fumigation Zones** must be followed.
- Appropriate respiratory protection (as outlined in Section 6, RESPIRATORY PROTECTION) **MUST** be worn if entry into the fumigated site is required at any point from the beginning of application until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone.
- Ships and railcars which will be in transit post application are exempt from this requirement. Note: the transport of non-aerated commodities is permitted by rail or ship/barge only. Other transport vehicles such as trucks, vans, and trailers are prohibited from travel over public roads or highways until completely aerated to a hydrogen phosphide level at or below 0.1 ppm.
- The fumigation zone must extend from the perimeter of the application site equally in all directions.

7.2 Minimum Distance of Fumigation Zone

During the fumigation period (i.e., from the beginning of the fumigant application until the beginning of aeration) and the aeration period (i.e., from the beginning of aeration until the hydrogen phosphide level is at or below 0.1 ppm), the following minimum distances for the fumigation zone as outlined in Table 7.2 **MUST** be adhered to.

Table 7.2: Minimum Distance of Fumigation Zone

SITE	Minimum Distance of Fumigation Zone	
	Fumigation Period	Aeration Period
Indoor Application Sites	10 metres OR all workers inside the facility MUST wear a personal hydrogen phosphide monitor.	Fumigation zone determined by licensed/certified applicator
Outdoor Application Sites	Fumigation zone determined by licensed/certified applicator	

Indoor Application Sites: Any fumigation that is taking place within an enclosed structure (except for tarpaulins, see below),

such as grain elevators/bins, warehouses, mills, food processing plants, flat houses, upright bins and bunkers. Also includes containers that are fumigated within a structure.

For indoor application sites, provided that all workers within the entire indoor structure are wearing a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm, a minimum fumigation zone of 10 metres does not need to be established. If at any time hydrogen phosphide levels exceed 0.1 ppm, all individuals who are not wearing respiratory protection as outlined in Section 6 MUST vacate the area until hydrogen phosphide levels are at or below 0.1 ppm.

Outdoor Application Sites: Any fumigation that is taking place outdoors (except for tarpaulins and railcars, see below), such as silos and containers, outdoor upright bins, and outdoor grain bins.

During the aeration period (i.e., from the beginning of aeration until the hydrogen phosphide level is at or below 0.1 ppm), the fumigation zone is determined by the licensed/certified applicator who MUST be present for the duration of the aeration period.

7.3 Extension of Fumigation Zone As A Result of Monitoring

During the fumigation period (i.e., from the beginning of the fumigant application until the beginning of aeration), a supervising fumigant applicator/handler or someone who has been trained by the certified applicator must periodically monitor hydrogen phosphide levels at several locations along the fumigation zone perimeter (i.e., according to a schedule made by the licensed/certified applicator as per site characteristics and environmental conditions). During the aeration period (i.e., from the beginning of aeration until the hydrogen phosphide level is at or below 0.1 ppm), the licensed/certified applicator must periodically monitor hydrogen phosphide levels at several locations along the fumigation zone perimeter (i.e., according to a schedule as per site characteristics and environmental conditions).

If at any time the person monitoring hydrogen phosphide levels detects concentrations greater than 0.1 ppm, the area must immediately be cleared of all individuals who are not wearing respiratory protection as outlined in Section 6, and the fumigation zone must be extended until the hydrogen phosphide is at or below 0.1 ppm along the perimeter. If an extension of the fumigation zone is not feasible, appropriate measures must be implemented (e.g. cease the delivery/dispensing of product, sealing of leaks, limiting aeration) until the hydrogen phosphide level is at or below 0.1 ppm at the fumigation zone perimeter at which time fumigation activities may continue.

7.4 Authorized Entry into Fumigation Zones

Only if necessary, should authorized pesticide applicators/handlers or workers be present in the fumigation zone. All workers (including authorized pesticide applicators/handlers) in the fumigation zone during fumigation and until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone, MUST wear respiratory protection as outlined in the RESPIRATORY PROTECTION section OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm. Each unprotected worker in the fumigation zone must know how to operate the personal hydrogen phosphide monitor and be informed of procedures required if the levels of hydrogen phosphide gas exceed 0.1 ppm. If at any time hydrogen phosphide levels exceed 0.1 ppm, all individuals who are not wearing respiratory protection as outlined in Section 6 MUST vacate the area until hydrogen phosphide levels are at or below 0.1 ppm.

7.5 Placarding of Fumigation Zones

The fumigation zone must be placarded as outlined in Section 10, PLACARDING OF FUMIGATION AREAS.

8 MANDATORY ANNUAL TRAINING

8.1 Responsible Parties

- Certified/Licensed Applicator: Responsible for informing the person in charge of the facility or agricultural establishment, the employer or his/her representative of the requirement for the mandatory training and maintenance of training records, and directing the person in charge of the facility or agricultural establishment, the employer or his/her representative on how to obtain a copy of the product-specific training material from the manufacturer.
- Manufacturer: Responsible for having the product-specific training material readily available upon request.
- The person in charge of the facility or agricultural establishment or the employer or his/her representative is responsible for:
 - Developing site-specific training material.
 - Providing both product-specific and site-specific training to workers.
 - Maintaining training records for their employees/workers for a minimum of two years.

8.2 Personnel

In facilities or agricultural establishments (i.e., farms) where this product is used, all employees (i.e., all individuals such as workers, contractors, handlers, farmers, and farm workers) who are present in the facility or agricultural establishment during product use, MUST complete mandatory annual training using product-specific training material supplied by the manufacturer, and additional facility-specific information developed by the employer or his/her representative.

8.3 Mandatory Training Elements

The training material MUST include the following information:

Hazards of Hydrogen Phosphide Gas: Phosphine-releasing products are classified as restricted-class products due to the high acute toxicity of phosphine gas. Signs and symptoms of phosphine exposure are summarized as follows:

Symptoms of mild exposure include:

- Malaise (indefinite feeling of sickness), ringing in the ears, fatigue, nausea, and pressure in the chest.
- Weakness, vomiting, pain just above the stomach, chest pain, diarrhea, and difficulty breathing.

Symptoms of severe poisoning include:

- Dizziness, blue/purple skin colour, unconsciousness and death.
- High exposure to phosphine may also lead to fluid in the lungs, and effects on the liver, kidneys, lungs, nervous system and circulatory system.
- Note: Symptoms of severe poisoning may appear within a few hours to several days.

The 0.1 ppm Exposure Limit: Information on the 0.1 ppm exposure limit and that it is not a time-weighted average threshold limit value. Workers MUST NOT be exposed to phosphine levels above 0.1 ppm for any duration of time. Frequent exposure to concentrations above permissible levels over a period of days or weeks may cause poisoning.

How to Use Personal Hydrogen Phosphide Monitors and Personal Protective Equipment: Information on facility-specific equipment, such as how to calibrate and use personal hydrogen phosphide monitors, and proper fit-testing of respirators. In addition, information on when respiratory protection should be used must be included.

Procedures when Levels of Hydrogen Phosphide Gas Exceed 0.1 ppm: Facility-specific details on what to do when hydrogen phosphide levels exceed 0.1 ppm, where workers are to go, who they should contact and where personal protective equipment is located.

9. APPLICATOR AND WORKER EXPOSURE

9.1 Hydrogen Phosphide Exposure Limits

Exposure to hydrogen phosphide must never exceed 0.1 ppm. Entry by unprotected workers is only permitted after the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. All workers present in the fumigation zone during the fumigation or aeration periods MUST wear appropriate respiratory protection, as outlined in the Applicator's Manual – RESPIRATORY PROTECTION OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm. Each unprotected worker in the fumigation zone must have a personal hydrogen phosphide monitor that is functional for the duration of the work period, must know how to operate the personal hydrogen phosphide monitor and be informed of procedures required if the air levels of hydrogen phosphide gas exceed 0.1 ppm. All persons in the fumigated site and the fumigation zone are covered by this 0.1 ppm exposure safety limit. Periodic gas measurements should be made in the worker's breathing zone using hydrogen phosphide low level detector tubes or electronic metering devices, unless they are protected by a NIOSH-approved self-contained breathing apparatus with full face piece operated in a pressure-demand or other positive-pressure mode OR a NIOSH-approved air-line respirator with a full face piece operated in a pressure-demand or other positive-pressure mode combined with an auxiliary self-contained positive-pressure breathing apparatus.

The level of hydrogen phosphide gas may be higher at the core of the commodity than the surrounding air. Monitoring is required when unloading or otherwise disturbing a commodity that has been fumigated to ensure that liberation of gas from the treated commodity does not result in unacceptable levels of hydrogen phosphide.

9.2 Application of Fumigant

Depending upon temperature and humidity levels, **Magtoxin® Prepac Spot Fumigant** will release hydrogen phosphide gas slowly upon exposure to moisture from the air. Appropriate respiratory protection, as outlined under Section 6, RESPIRATORY PROTECTION, MUST be worn at all times when levels of hydrogen phosphide are above 0.1 ppm. If hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm MUST be worn. If at any time hydrogen phosphide levels exceed 0.1 ppm, all individuals who are not wearing respiratory protection as outlined in Section 6 MUST vacate the area until hydrogen phosphide levels are at or below 0.1 ppm. For safety purposes, monitoring of hydrogen phosphide levels during fumigation is required and may be conducted using low level detector tubes or electronic metering devices according to the information on Industrial Hygiene Monitoring in Section 8.6 of this Applicator's Manual.

9.3 **Leakage from Fumigated Sites**

Hydrogen phosphide gas is highly mobile and given enough time may penetrate seemingly gas-tight materials such as concrete and cinder block. Therefore, adjacent, enclosed areas likely to be occupied must be monitored to ensure that significant leakage has not occurred. Sealing of the fumigated site, establishment of a fumigation zone, and/or air flow in the occupied areas must be sufficient to meet the 0.1 ppm exposure safety limit.

9.4 **Aeration and Reentry**

If the fumigated site is to be entered after fumigation, it must be aerated until the level of hydrogen phosphide gas is at or below 0.1 ppm in the fumigated site and the fumigation zone. Otherwise appropriate respiratory protection (as outlined in Section 6, RESPIRATORY PROTECTION) must be worn.

The fumigated site must be periodically monitored (i.e., according to a schedule made by the licensed/certified applicator as per site characteristics and environmental conditions) for hydrogen phosphide levels as well as at several locations along the fumigation zone perimeter to ensure that liberation of gas from the treated commodity does not result in the development of unacceptable levels of hydrogen phosphide. If at any time the licensed/certified applicator detects concentrations greater than 0.1 ppm, the area must immediately be cleared of all individuals who are not wearing respiratory protection as outlined in Section 6, and the fumigation zone must be extended until levels are at or below 0.1 ppm along the perimeter. If an extension of the fumigation zone is not feasible, appropriate measures must be implemented (e.g. sealing of leaks, limiting aeration) until the hydrogen phosphide level is at or below 0.1 ppm at the fumigation zone perimeter at which time fumigation activities may continue.

Adhere to provincial ambient air quality criteria standards and monitor downwind gas levels. Ensure that the fumigated site and the fumigation zone are secure and placarded to prevent public and unauthorized worker access.

9.5 **Handling Un-Aerated Commodities**

Exposure to hydrogen phosphide must never exceed 0.1 ppm during moving, storage or processing of incompletely aerated commodities by unprotected workers. If levels exceed 0.1 ppm, appropriate respiratory protection as outlined in Section 6, RESPIRATORY PROTECTION must be worn. If hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn.

The level of hydrogen phosphide gas may be higher at the core of the commodity than the surrounding air. Monitoring is required when unloading or otherwise disturbing a commodity that has been fumigated to ensure that liberation of gas from the treated commodity does not result in unacceptable levels of hydrogen phosphide.

9.6 **Industrial Hygiene Monitoring**

At each site and operation under fumigation, monitor airborne hydrogen phosphide concentrations in all areas to which fumigators and other workers have had access during fumigation and aeration. Perform such monitoring in workers' breathing zones. This monitoring is performed to determine when and where respiratory protection is required. When monitoring for hydrogen phosphide levels, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm MUST be worn. Periodic gas measurements in those areas must be taken to determine whether conditions have significantly changed or if an unexpected garlic-like odour is present. Record all monitoring data in an operation log or manual.

There are a number of devices on the market for the measurement of hydrogen phosphide gas levels for industrial hygiene purposes. One of these is the hydrogen phosphide detector tube used in conjunction with the appropriate hand-operated air sampling pump. These devices are reliable, portable, simple to use, do not require extensive training and are relatively rapid, inexpensive and accurate. Low level detector tubes or electronic metering devices are available which can detect 0.1 ppm and are suitable for industrial hygiene monitoring. Information on hydrogen phosphide (phosphine, PH₃) detector tubes or electronic metering devices may be obtained from your distributor.

10. PLACARDING OF FUMIGATED AREAS

IMPORTANT: Post warning placards around both the application site (fumigated site) and the fumigation zone perimeter before the actual fumigation treatment. Relocating the placards may be required if the fumigation zone needs to be extended at any point during the fumigation or aeration period.

The licensed/certified applicator must placard or post warning signs at all usual points of entry and along other likely routes of approach where people not under the land operator's control may be in close proximity to the fumigated site and the fumigation zone. Placards should be placed in advance of the fumigation to keep unauthorized persons away. Some examples of points of entry include, but are not limited to, roadways, sidewalks, paths, and bike trails. Some examples of likely routes of approach are the area between a fumigation zone site and a roadway, or the area between a fumigation zone site and a housing development.

Posting of warning signs for the fumigation zone perimeter is required, UNLESS there is a physical barrier (e.g. fence) that prevents access into the fumigation zone. Signage must not be removed until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. Only a licensed/certified applicator can authorize removal of warning signs.

Placards must be at least 28 cm long and 21 cm wide and made of substantial material that can be expected to withstand adverse weather conditions. They must bear the following information:

1. The signal word DANGER in letters at least 7cm high and the SKULL AND CROSSBONES symbol in red.
2. The "DO NOT WALK" symbol.
3. The statement "Area and/or commodity under fumigation, DO NOT ENTER".
4. The statement, "This sign may only be removed after the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone.
5. The date and time when fumigation begins and the date and time when aeration can begin.
6. Name of fumigant used: Degesch **Magtoxin**® Prepac Spot Fumigant; Registration #26524
7. Contact information (name, address and telephone number) for the supervising fumigant handler in charge of the fumigation.
8. Placards must bear a 24-hour emergency response telephone number.

Do not remove placards until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. To determine whether aeration is complete, each fumigated site and the fumigation zone perimeter must be monitored and shown to contain 0.1 ppm or less hydrogen phosphide gas in the air space around and, if feasible, within the fumigated equipment.

It is recommended that the trained persons, under the supervision of a licensed/certified applicator, responsible for removing placards be familiar with the physical, chemical and toxicological properties of hydrogen phosphide. They should also be knowledgeable in making gas concentration measurements, exposure limits and symptoms and first aid treatment for hydrogen phosphide poisoning.

11. FUMIGATION MANAGEMENT PLAN

A FUMIGATION MANAGEMENT PLAN MUST BE WRITTEN FOR ALL FUMIGATIONS PRIOR TO ACTUAL TREATMENT

A fumigation management plan template is available from the manufacturer.

A Fumigation Management plan must be devised to cover application and exposure period, aeration and disposal of the fumigant so as to keep to a minimum any human exposures to hydrogen phosphide and to help ensure adequate control of pests.

The licensed/certified applicator is responsible for working with the owners and/or responsible employees of the site to be fumigated to develop and follow a Fumigation Management Plan. The Fumigation Management Plan is intended to ensure a safe and effective fumigation. The Fumigation Management Plan must address characterization of the site, and include appropriate monitoring and notification requirements, and include a record that the following have been completed:

1. Inform the person in charge of the facility where the fumigation will take place that all workers must complete mandatory annual training as outlined in the Applicator's Manual – MANDATORY ANNUAL TRAINING. Training includes information on the hazards of the product, the use of safety equipment (i.e., respiratory protection

- and personal monitors), and the exposure limit of 0.1 ppm.
2. Inspect the site to determine its suitability for fumigation.
 3. When sealing is required, consult previous records for any changes to the site/structure, seal leaks, and monitor any occupied adjacent buildings to ensure safety.
 4. Prior to each fumigation, review any existing Fumigation Management Plan, MSDS, Applicator's Manual and other relevant safety procedures with company officials and appropriate employees.
 5. 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.
 6. Consult with company officials to ensure that an appropriate monitoring plan will be in place to confirm that nearby workers and bystanders will not be exposed to levels above the allowed hydrogen phosphide safety limit (i.e. 0.1 ppm) during application, fumigation and aeration. This plan must take into consideration all of the fumigation zone requirements and demonstrate that nearby residents will not be exposed to concentrations above the allowable limits.
 7. Consult with company officials to develop procedures for local authorities to notify nearby residents in the event of an emergency.
 8. Confirm the placement of placards to secure entrance and along other routes of approach into any site under fumigation and along the fumigation zone perimeter.
 9. Confirm the required safety equipment is in place and the necessary manpower is available to complete a safe and effective fumigation.

It is important to note that some Fumigation Management Plans will be more comprehensive than others. All Fumigation Management Plans should reflect the experience and expertise of the licensed/certified applicator and circumstances at and around the site/structure and the fumigation zone.

In addition to the development of the Fumigation Management Plan, the licensed/certified applicator must read the entire label and the Applicator's Manual and follow its directions carefully. If the licensed/certified applicator has any questions about the development of a Fumigation Management Plan, contact the product manufacturer for further assistance.

The Fumigation Management Plan and related documentation, including monitoring records, must be maintained for a minimum of 2 years.

GUIDANCE FOR PREPARATION OF A 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, yet allowing for flexibility, a safe and effective fumigation can be performed.

Before any fumigation begins, carefully read and review the product label and the 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 Degesch America, Inc. for assistance. Finally, before any fumigation begins, you must be familiar with and comply with all applicable federal, provincial and municipal laws and 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 Fumigation Management 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. Control of insect infestation
 - b. Control of vertebrate pests
 - c. Plant pest quarantine

2. Determine the type of fumigation. For example:
 - a. Space: tarp, mill, warehouse, food processing plant,
 - b. Vehicle: railcar, truck, van, container
 - 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 Cargo, Fumigation and Tackle Regulations under the *Canada Shipping Act, current to August 5, 2014*.

3. Fully acquaint yourself with the site 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 structural 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 fumigant application locations if the job involves entry into the structure for fumigation.
 - k. Review labeling and Applicator's Manual
 - l. Location of command centre
 - m. Exposure time considerations:
 1. Product (prepacks) 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
 - n. Determination of dosage:
 1. Cubic footage or other appropriate space/location calculations
 2. Structure sealing capability and methods
 3. Label recommendations
 4. Temperature, humidity, wind
 5. Commodity/space volume
 6. Past history of fumigation of the site/structure
 7. Exposure time
 8. Amount of fumigant used
 9. Actual concentration achieved
 - o. Distance to other on-site and neighbouring off-site structures, recreational areas or areas where bystanders may be exposed.
 - p. Site of aeration vent(s) to be opened to aerate site/structure.
 - q. Fumigation zone requirements, including provisions for areas not under the control of the owner/operator of the application site (e.g. agricultural areas, roads and rights-of-way, publically owned and/or operated areas, difficult to evacuate sites and other residential areas.

B. PERSONNEL

1. Confirm in writing that all personnel in and around the site 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 concerning the hazards that may be encountered, and about the selection of personal protection devices, including sufficiently sensitive 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 an emergency.

C. MONITORING

1. Safety
 - a. Scheduled ambient air monitoring of hydrogen phosphide concentrations must be conducted, downwind, along the fumigation zone perimeter to prevent exposure of unprotected workers and bystanders to concentrations of hydrogen phosphide greater than 0.1 ppm*** and to determine where exposures may occur. It may be necessary to monitor gas levels in other areas as well. Document where monitoring will occur.
 - b. Monitor (and record) the wind direction and adjust the hydrogen phosphide monitoring if wind direction changes over the fumigation/aeration period.
 - c. Keep a log or manual of monitoring records for each fumigated site and the fumigation zone. This log must, at a minimum, contain the timing, number of readings taken and level of concentrations found in each location.
 - d. When monitoring, document any hydrogen phosphide level even if it is present below the limit of detection.
 - e. From the beginning of the fumigant application and until the end of the fumigation period, a supervising fumigant applicator/handler or someone under his/her supervision must periodically monitor (i.e., according to a schedule made by the licensed/certified applicator as per site characteristics and environmental conditions) hydrogen phosphide levels at several locations along the fumigation zone perimeter. During aeration, the licensed/certified applicator must periodically monitor (i.e., according to a schedule made by the licensed/certified applicator as per site characteristics and environmental conditions) hydrogen phosphide levels at several locations along the fumigation zone perimeter.

If at any time the person monitoring hydrogen phosphide levels detects hydrogen phosphide concentrations greater than 0.1 ppm, the area must immediately be cleared of all individuals who are not wearing respiratory protection as outlined in Section 6, and the fumigation zone must be extended until the hydrogen phosphide level is at or below 0.1 ppm along the perimeter. If an extension of the fumigation zone is not feasible, appropriate measures must be implemented (e.g. cease the delivery/dispensing of product, sealing of leaks, limiting aeration, etc.) until such time that the hydrogen phosphide level is at or below 0.1 ppm at the fumigation zone perimeter at which time fumigation activities may continue.

*****NOTE: An evacuation action may be necessary when hydrogen phosphide levels exceed 0.1 ppm.** To determine hydrogen phosphide levels, readings may be taken using low level detector tubes or electronic metering devices.

2. Efficacy

- a. Hydrogen phosphide readings should be taken from within the fumigated site and/or structure to

ensure proper gas concentrations, along with temperature and relative humidity readings. Readings must be taken immediately after introduction of the product, six hours after the introduction of the product followed by a reading every twelve hours during the fumigation period. Finally, hydrogen phosphide readings should be taken every thirty minutes until aeration is complete. Refer to Section 11, DIRECTIONS FOR USE for detailed information.

- b. All hydrogen phosphide, temperature and relative humidity readings should be documented.

D. NOTIFICATION

1. Confirm all the appropriate local authorities (fire departments, police departments, etc.) have been notified as per label instructions, local ordinances, 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 hydrogen phosphide levels are exceeded in an area that could be dangerous to bystanders and/or domestic animals. Elaborate in this section the key elements of an Emergency Response Plan including reference to evacuation procedures. Evacuation procedures must take into consideration any difficult-to-evacuate sites, which may take longer to evacuate. Difficult-to-evacuate sites are defined as schools (preschool to grade 12), provincially licensed day care centres, nursing homes, assisted living facilities, hospitals, in-patient clinics and prisons.

E. SEALING PROCEDURES

1. Sealing must be adequate to control the pests. Care should be taken to ensure that sealing materials will remain intact until the fumigation is complete.
2. If the site has been fumigated before, review the previous Fumigation Management Plan for previous sealing information.
3. Make sure that construction/remodeling has not changed the site/structure in a manner that will affect the fumigation.
4. Warning placards must be placed to secure any entrance into the fumigated site and along other likely routes of approach.

F. APPLICATION PROCEDURES AND FUMIGATION PERIOD

1. Plan carefully and apply the product in accordance with the label requirements.
2. At least two persons, a licensed/certified applicator and trained person, or two persons trained in accordance with the Applicator’s Manual working under the direct supervision of the licensed/certified applicator must be present during fumigation of structures when entry into the structure for application of the fumigant is required. Appropriate respiratory protection, as outlined in Section 6, RESPIRATORY PROTECTION, MUST be worn at all times when levels of hydrogen phosphide are above 0.1 ppm, which may occur during delivery/dispensing of product, while attending to spills and leaks and while monitoring hydrogen phosphide levels during the fumigation period. If hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn.
3. Apply fumigant from the outside when and where appropriate.
4. Provide watchmen when you cannot secure the fumigated site and the fumigation zone from entry by unauthorized persons (e.g., by secondary locks, barricades, etc.) during the fumigation process.
5. When entering sites/structures, always follow applicable provincial legislation for confined spaces.
6. Turn off any electric lights in the fumigated site and/or structure, as well as all non-essential electrical motors.

G. POST-APPLICATION OPERATIONS

1. Provide watchmen when you cannot secure the fumigated site and the fumigation zone from entry (e.g., by secondary locks, barricades, etc.) by unauthorized persons during the aeration process.
2. Ventilate and aerate the fumigated site in accordance with site and/or structural limitations and nearby occupied areas so as to minimize bystander exposure.

3. Turn on ventilating or aeration fans where appropriate.
4. Determine hydrogen phosphide gas concentration in the fumigated environment from outside if possible. As much as possible, limit exposure, for example, by using monitoring equipment that measures indoor concentrations and displays results outside of the fumigated site. Use a sufficiently sensitive gas detector before entry into a fumigated site and/or structure to determine fumigant concentration.
5. During aeration, monitor gas levels periodically (i.e., according to a schedule made by the licensed/certified applicator as per site characteristics and environmental conditions) until the fumigated site and/or structure is ready for entry.
6. Keep written records of monitoring to document completion of aeration.
7. Consider temperature when aerating.
8. Remove fumigation warning placards, when authorized by a licensed/certified applicator, after aeration of the fumigated site is complete and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone as determined by using a detection device of sufficient sensitivity.
9. Inform business/client that employees/other persons may return to work or otherwise be allowed to enter the aerated site and/or structure.

12. DIRECTIONS FOR USE

12.1 General

- 12.1.1 The use of **Magtoxin®** Prepac Spot Fumigant is RESTRICTED due to the acute inhalation toxicity of hydrogen phosphide (phosphine, PH₃) gas, which is formed when this product is exposed to moisture in the air. These products are for retail sale to and use only by individuals holding an appropriate pesticide applicator certificate or license recognized by the provincial/territorial pesticide regulatory agency where the pesticide application occurs or by persons trained in accordance with the Applicator's Manual working under the direct supervision and in the physical presence of an applicator holding an appropriate pesticide applicator certificate or license. Physical presence means on site or on the premises. Read and follow the label and this Applicator's Manual which contains complete instructions for the safe use of this pesticide.
- 12.1.2 A fumigation zone must be established for all fumigated sites as per the instructions outlined under Section 7, FUMIGATION ZONE REQUIREMENTS. Prior to entry by unprotected workers, the fumigated site must be aerated and the hydrogen phosphide level must be at or below 0.1 ppm in the fumigated site and the fumigation zone.
- 12.1.3 Magnesium phosphide is a highly hazardous material and should be used only by individuals trained in its proper use. Before using, read and understand the entire label and this Applicator's Manual and follow all precautions, safety recommendations and directions.

Persons working with magnesium phosphide must be knowledgeable of the hazards of this chemical and trained in the use of required respiratory equipment and detector devices, emergency procedures, and use of the fumigant.

Additional copies of this Applicator's Manual are available from:

DEGESCH America, Inc.
153 Triangle Drive
P. O. Box 116
Weyers Cave, VA 24486
Telephone: (540) 234-9281/800-330-2525
Internet: www.degeschamerica.com
E-Mail: degesch@degeschamerica.com

DEGESCH CANADA
8685 Rue Lafrenaie
Saint-Leonard, QC
Canada H1P 2B6
Telephone: 514-852-3010

- 12.1.4 Never fumigate alone from inside the structure. At least two persons, a licensed/certified applicator and trained person, or two persons trained in accordance with the Applicator's Manual working under the direct

supervision of the licensed/certified applicator must be present during fumigation of structures when entry into the structure for application of the fumigant is required.

Appropriate respiratory protection, as outlined in Section 6, RESPIRATORY PROTECTION, MUST be worn at all times when levels of hydrogen phosphide are above 0.1 ppm, which may occur during delivery/dispensing of product, while attending to spills and leaks, during deactivation of unreacted product and while monitoring hydrogen phosphide levels during fumigation and aeration periods. If hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm, must be worn. The licensed/certified applicator must maintain visual and/or voice contact with all fumigation workers during the application of the fumigants.

- 12.1.5 Do not fumigate food processing machinery or equipment with **Magtoxin** Prepac Spot Fumigant when air temperature is below 5°C (40°F).
- 12.1.6 The site and equipment to be spot fumigated must first be inspected to determine if it can be made sufficiently gas tight. Then a Fumigation Management Plan must be developed prior to actual treatment to provide for safe and efficient application of the fumigant to include emergency procedures, etc., and to decide how monitoring should be conducted to prevent excessive exposures (refer to Section 11, FUMIGATION MANAGEMENT PLAN).
- 12.1.7 Wear a loose fitting long sleeve shirt, long pants, socks and shoes, and wear dry gloves of cotton or other breathable material while handling **Magtoxin**® pellets or their dust. It is not necessary to wear gloves or other protective clothing when handling **Magtoxin**® **Prepac Spot Fumigant**. Wash hands thoroughly after use. After fumigation activities, remove all protective clothing, check and ensure that there are no magnesium phosphide products trapped inside clothing, aerate in a well-ventilated area then wash thoroughly, separately, before reuse.
- 12.1.8 Hydrogen phosphide gas may flash at concentrations above its flammable limit. **Do not open Magtoxin**® **Prepac Spot Fumigant** pouches in an explosive environment. It is preferable to open them in open air, near a fan or other appropriate ventilation which will rapidly exhaust contaminated air. These precautions will also reduce the applicator's exposure to hydrogen phosphide gas.
- 12.1.9 Contact with water, acids or other liquids is prohibited. Liquids in contact with unreacted magnesium phosphide will greatly accelerate the production of hydrogen phosphide gas which would result in a toxic and/or fire hazard.
- 12.1.10 Piling of **Magtoxin**® **Prepacs**, their dust or the addition of liquid to the product is prohibited. Liquid in contact with unreacted magnesium phosphide will greatly accelerate the production of hydrogen phosphide gas which could result in a toxic and/or fire hazard.
- 12.1.11 As much as is possible, protect unused **Magtoxin**® **Prepac Spot Fumigant** from excessive exposure to atmospheric moisture during application.
- 12.1.12 Hydrogen phosphide gas may react with certain metals and their salts to produce corrosion. This gas is corrosive to copper, copper alloys and precious metals such as silver and gold. Sensitive equipment and items containing these elements should be removed or protected prior to fumigation with magnesium phosphide.
- 12.1.13 Under no circumstances shall any processed food, feed or bagged commodity come into direct contact with **Magtoxin**® **Prepacs**, pellets or residual dust, or a raw agricultural commodity that will be used directly as a food without further processing. Therefore, retrieval of the **Prepacs** at the end of the fumigation, prior to restarting the machinery or equipment is required unless applications have been made to fumiports or similar devices within the processing equipment, which will retain the fumigant blisters.
- 12.1.14 Respiratory protection approved for the concentration to which the fumigator will be exposed to must be worn (refer to Section 6, RESPIRATORY PROTECTION).

For hydrogen phosphide levels between 0.1 - 5 ppm, the minimum protection required is a NIOSH-approved air-purifying full face respirator (gas mask) with a chin-style front- or back-mounted canister approved for hydrogen phosphide OR a NIOSH-approved supplied-air respirator (i.e., air-line respirator or self-contained breathing apparatus) with a full face piece.

For hydrogen phosphide levels above 5 ppm or at unknown concentrations, a NIOSH-approved self-contained breathing apparatus with a full face piece operated in a pressure-demand or other positive-pressure mode OR a NIOSH-approved air-line respirator with a full face piece operated in a pressure-demand or other positive-pressure mode combined with an auxiliary self-contained positive-pressure breathing apparatus must be worn.

For emergency use and/or to escape from conditions which are Immediately Dangerous to Life or Health (IDLH), keep available for use an adequate number of NIOSH-approved self-contained breathing apparatus with a full face piece operated in a pressure-demand or other positive-pressure mode.

- 12.1.15 Notify appropriate company employees prior to fumigation and provide relevant safety information to local officials (fire department, rescue squad, police, etc.) for use in the event of an emergency. Observe all Provincial pesticide regulations.

12.2. **Efficacy**

Spot fumigation is the short term treatment of food and feed processing machinery and equipment with toxic vapors for control of the adult and larval life stages of pests, which infest food particles remaining within the equipment. The minimum exposure time of 34 hours is not long enough to ensure destruction of pupae or eggs. In addition, much of the equipment to be treated is of loose or open construction and cannot readily be sealed. Other than in bins and tanks, it is not unusual for virtually all of the hydrogen phosphide gas to have leaked out in 24 hours or less. Since this type of treatment merely interrupts the life cycle of the pests, spot fumigations need to be performed at regular intervals, at intervals of one month or less, until the problem is brought under control.

It is recommended that gas concentration measurements are made and/or test insect cages to be placed inside the treated equipment to determine efficacy and to ensure that sealing has been adequate. In some cases the entire piece of equipment or machinery could be tarped with plastic sheeting of 4 mil thickness. A good rule of thumb for obtaining satisfactory results is a minimum of 50 to 100 ppm hydrogen phosphide remaining 10 hours after application of the **Magtoxin®** Prepac Spot fumigant. Once a particular facility has been treated successfully several times and trouble spots eliminated the frequency of efficacy checks and/or concentration may be reduced.

There are many situations in which the use of **Magtoxin®** Prepac Spot Fumigant alone will not solve the infestation problem, and it is generally necessary to use other sanitation techniques. The equipment should be cleaned and run to remove as much of the food or food debris prior to spot fumigation. Dead stock should be removed by vacuuming or other means. Fogging with other approved pesticides is recommended in conjunction with spot fumigant to aid in controlling infestations outside of the machinery and in pieces of equipment which is not practical or possible to seal. In addition to careful sealing prior to treatment, it is a good idea to repair and maintain equipment in proper working condition so as to reduce leaks.

12.3 **Fumigant Exposure Conditions & Recommended Dosage**

Each **Magtoxin®** Prepac contains 33 blisters, each holding 2 **Magtoxin** Pellets. Each **Magtoxin** Pellet will liberate 0.2g of hydrogen phosphide for a total of 13.2g of gas per Prepac. The Prepacs are supplied in a continuous roll of five Prepacs connected end to end. Once opened, the entire contents of a **Magtoxin** Prepac pouch (5 prepacs) must be used, as it cannot be resealed. The appropriate amount of fumigant for application to the machinery and equipment may be cut from the roll of Prepacs using sharp scissors or another cutting tool. The recommended dosage is 1-2 Prepacs per 37m³ (1320 cubic feet) in equipment that is relatively gas tight or which can readily be sealed. This corresponds to a dose of 10-20 grams of hydrogen phosphide per 28m³ (1000 cubic feet). It is permissible to use up to 10 Prepacs per 37m³ (1320 cubic feet), 100 grams of hydrogen phosphide per 28m³ (1000 cubic feet), in sifters, purifiers and other pieces of equipment which cannot readily be sealed. However, increased dosage will not completely compensate for gas leaks from poorly sealed or open equipment. In many cases, use of fogging or other sanitation techniques should be relied upon rather than increasing dosage of **Magtoxin®**Prepac Spot Fumigant.

Spot fumigations with **Magtoxin®** Prepac Spot Fumigant must not be conducted at temperatures below 5°C (40°F). The minimum duration of the spot fumigation is 34 hours. This exposure period serves not only to control the infestation, but also to allow ample time for reaction of the Prepac. Deactivation and disposal of **Magtoxin®** Prepacs that are only partially spent will require extra care and precautions. See recommendations given under “Disposal Instructions”.

12.4 **General Recommendations for Spot Fumigations with Magtoxin® Prepac Spot Fumigant**

- 12.4.1 The most important aspect in spot fumigation is a thorough understanding of the equipment and all of the

various product and air-flow patterns. The fumigator should review schematics and/or diagrams of the facility and a walking survey should be conducted to inspect the food processing machinery and equipment

An overall plan for the spot fumigation should be developed to include the following items:

- The acquisition of the necessary manpower and supplies to include safety equipment and other essential items.
- A route through the facility for efficient application of the **Magtoxin®** Prepac to minimize workers' exposures and time required.
- A plan for security during the fumigation period to include placarding and notification of facility's personnel so that no unauthorized persons can enter the treated areas prior to aeration.
- A plan for sealing the equipment prior to application of the spot fumigant. Recommendations for repair of machinery, transfer lines, bins or other equipment to improve its ability to retain gas should be given to facility maintenance personnel.
- Dosage rates and application points. Methods of reducing applicator's exposure must be planned in advance, including use of appropriate respiratory protection, as outlined in Section 6, RESPIRATORY PROTECTION.
- A log to include dosage rates and application points will facilitate accounting for Prepacs during application of the fumigant and its recovery after exposure and aeration.
- Recommendations for the permanent installation of fumiports inside the equipment so as to eliminate the possibility of contamination and the requirement for immediate recovery of the applied dose prior to restart.
- Gas readings should be taken, to characterize worker's exposure during application, to measure efficacy inside equipment during the exposure period and low level measurements to ensure proper aeration prior to turning the fumigated areas over to facility's personnel. Appropriate respiratory protection, as outlined in Section 6, RESPIRATORY PROTECTION, must be worn.
- A plan for recovery, deactivation and disposal of the spot fumigant.
- Shut down of all ventilation systems and fans during exposure period.

12.5 **Directions for Spot Fumigations with Magtoxin Prepac Spot Fumigant**

Magtoxin Prepac Spot Fumigant is recommended for spot treatments to control stored products insects in bins, silos, holding tanks, elevator boots and heads, filters, conveyers, spouting, purifiers, food processing equipment, sifters, rollers, dusters and related equipment in mills, food and feed processing plants, breweries and similar industries.

Spot treatment of equipment monthly with **Magtoxin** Prepac Spot Fumigant or as needed to supplement general pest management program.

12.5.1 **General Statement**

Regardless of the type of site or equipment to be treated, there are several important factors common to all application procedures. A number of these points have been covered in other sections of this Applicator's Manual but are listed again in the following for completeness.

1. A Fumigation Management Plan must be written for all fumigations prior to actual treatment and must be devised for application, aeration and disposal of the fumigant so as to keep to a minimum any exposures to hydrogen phosphide (refer to Section 11, FUMIGATION MANAGEMENT PLAN).
2. A fumigation zone must be established for all fumigated sites as per the instructions outlined under Section 7, FUMIGATION ZONE REQUIREMENTS.
3. Entry by unprotected workers into the fumigated site is only permitted after the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. For all fumigations, appropriate respiratory protection must be worn if entry into the fumigated site and the fumigation zone is required at any point from the beginning of application until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. Refer to the RESPIRATORY PROTECTION and the APPLICATOR AND WORKER EXPOSURE sections. If entry into the fumigation zone is required at any point from the beginning of application until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site

and the fumigation zone, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn.

4. Observe all precautionary and safety statements mentioned elsewhere in this Applicator's Manual.
5. Meet with appropriate facility's personnel to discuss the planned fumigation and to ensure that no unauthorized persons will be permitted to enter treated areas prior to aeration.
6. If possible, have equipment repaired by plant personnel and fumiports installed at convenient application points.
7. The site or equipment to be fumigated must be sealed so as to maintain a suitable gas concentration over the time period required for control of insect pests.
8. Seal all equipment to which **Magtoxin** Prepac Spot Fumigant will be applied. Eliminate drafts inside the equipment by closing off sections, which have openings. Take any other steps necessary to prevent air movement inside the equipment. Seal all openings with tape, tarping, (4 mil.) etc., to prevent escape of hydrogen phosphide into rooms housing the equipment. Sites to be fumigated must be tightly sealed.
9. Run machinery to empty the process stream and remove dead stocks where possible prior to application of **Magtoxin** Prepac Spot Fumigant.
10. Windows and doors in rooms housing equipment should be closed prior to application and kept closed during exposure periods to reduce drafts. Do not fumigate alone. At least two persons trained in the use of magnesium phosphide must be present during the fumigation, if fumigation is performed from within a structure.
11. Using sharp scissors or a similar cutting device, cut the appropriate amount of fumigant from the roll of Prepacs and apply to the equipment. Be careful not to cut into the blisters and allow intact pellets or spent dust to fall into the machinery. Make sure the Prepacs are flat and are not folded over during application. Prominently mark or otherwise indicate the points of application so that the applied dose may be readily located and recovered after aeration. Aluminum foil pouches in which the **Magtoxin** Prepacs are packed are not resealable and may not be returned to storage after they have been opened. Once a pouch has been opened, its entire contents must be used or deactivated for disposal.
12. Under no circumstances shall any processed food, feed or bagged commodity come into direct contact with **Magtoxin** Prepacs, pellets, residual dust, or a raw agricultural commodity that will be used directly as a food without further processing.
13. All accesses leading to the area under fumigation must be properly placarded with warning signs. Only provincially licensed fumigators, wearing the appropriate respiratory protection, are permitted to enter treated areas prior to aeration.
14. Aeration may be initiated, after the fumigation period, by turning on ventilation equipment and opening doors and windows in the treated areas. Remove covers from bins, vessels and other equipment and turn on dust collector fans. Ensure that treated areas cannot be entered by unauthorized persons until after aeration is complete. Ensure placards are still visible after doors and windows are opened for aeration. Aeration is generally complete in less than one hour.
15. Do not remove warning placards or permit entry into treated areas without respiratory protection until the gas concentration is 0.1 ppm or below as indicated by a suitable detector for hydrogen phosphide.
16. Collect all spent or partially spent **Magtoxin** Prepacs from the treatment equipment. Transport this material to an appropriate site for further deactivation following directions given under Section 13, DISPOSAL.

12.6 **Food and Feed Processing Machinery and Equipment**

Various pieces of commonly encountered food processing equipment are listed in the following along with

comments relating to their successful spot treatment with **Magtoxin** Prepac Spot Fumigant.

1. A Fumigation Management Plan must be written for all fumigations prior to actual treatment (see Section 11).
 2. Using the label, calculate the duration of the fumigation and the dosage of **Magtoxin** Prepac Spot Fumigant to be applied to food and feed processing machinery and equipment based upon the volume of the area being treated, air temperature and general tightness of the sealing around the food and feed processing machinery and equipment.
 3. A fumigation zone must be established as per Section 7, FUMIGATION ZONE REQUIREMENTS.
 4. Carefully seal and placard the space to be fumigated and along the ~~buffer~~ fumigation zone perimeter as per Section 10, PLACARDING OF FUMIGATION AREAS.
 5. Wear appropriate respiratory protection while handling **Magtoxin**® Prepacs as per the instructions outlined in Section 6, RESPIRATORY PROTECTION. If hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn.
 6. Doors leading to the fumigated space should be closed, sealed, locked and placarded with warning signs.
 7. Periodically monitor hydrogen phosphide gas levels at several locations along the fumigation zone perimeter (i.e., according to a schedule made by the licensed/certified applicator as per site characteristics and environmental conditions). If at any time the person monitoring hydrogen phosphide levels detects hydrogen phosphide concentrations greater than 0.1 ppm, the area MUST immediately be cleared of all individuals who are not wearing respiratory protection as outlined in Section 6, and the fumigation zone must be extended until the hydrogen phosphide levels are at or below 0.1 ppm along the perimeter and warning signs relocated to reflect the new fumigation zone perimeter. Refer to the sections on FUMIGATION ZONE REQUIREMENTS and PLACARDING OF FUMIGATION AREAS for detailed instructions.
 8. Upon completion of the exposure period, windows, doors, vents, etc., should be opened and the fumigated area allowed to aerate. Do not enter the structure and the fumigation zone without appropriate respiratory protection until the hydrogen phosphide concentration is at or below 0.1 ppm in the structure and the fumigation zone. If entry into the fumigation zone is required, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm MUST be worn until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone. When required, gas concentration readings may be taken using low level detector tubes or electronic metering devices to ensure safety of personnel who enter the fumigated site and the fumigation zone. Refer to the section on RESPIRATORY PROTECTION and APPLICATOR AND WORKER EXPOSURE.
 9. Collect the spent **Magtoxin** Prepacs for disposal, with or without further deactivation, following directions given under Section 14, DISPOSAL.
 10. Remove fumigation warning placards when the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the fumigation zone (see Section 10, PLACARDING OF FUMIGATION AREAS).
- **Mills and Roll Stands** – These are frequently separated front and back, and the dosage should be applied in both sections. Mills and roll stands are generally sufficiently gas tight or can readily be sealed so as to obtain satisfactory results.
 - **Shaker Boxes and Sifters** – Shaker boxes and sifters are generally not gas tight but may be spot treated without further sealing if air currents within the process stream are eliminated. It is recommended that the **Magtoxin** Prepac dose be applied at the bottom.
 - **Purifiers** – Purifiers cannot be successfully spot fumigated unless they are completely sealed. Fogging

with an approved pesticide is recommended in facilities where sealing of the purifiers is not practical or too labour intensive.

- **Hoppers and Bins** – Hoppers and bins are generally sufficiently gas tight with little or no sealing. Valves and vents should be closed prior to application of the prepac.
- **Boots, Closed Conveyors and Transfer Lines, Down Spouts and Pneumatic Tubes** – These structures are relatively gas tight and easy to fumigate. Hydrogen phosphide gas will travel readily through open lines, however, it is recommended that they be treated at intervals of no greater than 15 m (50 feet) apart.
- **Air Filter** – Sealing of the air filters is required to eliminate or minimize air currents in the process stream. The filter itself should be carefully sealed along with all roof vents leading from the filter.

13. STORAGE INSTRUCTIONS

1. Do not store in buildings where humans or domestic animals reside. This product must be stored away from Lodging for humans, animal quarters and normal work areas to avoid inadvertent exposure.
2. Store **Magtoxin®** Prepac Spot Fumigant in a dry, well-ventilated area away from heat, under lock and key. Maintain temperature below 52°C (130°F). Post appropriate signage indicating it as a pesticide storage area. Do not contaminate water, food or feed by storing pesticides in the same areas used to store these commodities.
3. Keep out of reach of children and prevent access by unauthorized personnel.
4. **Magtoxin** Prepac are supplied in gas-tight, aluminum foil pouches packed in a metal pail with removable lid. . These pouches are not re-sealable and the Prepac must be used immediately or disposed of once they have been opened.
5. The shelf life of Magotxin Prepac Spot Fumigant is virtually unlimited as long as the pouches are tightly sealed and properly stored in original metal pail.

14. DISPOSAL INSTRUCTIONS

14.1 General

Pesticide wastes are toxic. Open dumping is prohibited. Do not discharge this product, or material containing this product, into natural waterways, wetlands (swamps, bogs, marshes, potholes, etc.) or municipal wastewater collection systems. Proper disposal of magnesium phosphide is required to ensure minimal impact on the environment.

Unreacted or partially reacted magnesium phosphide is acutely hazardous and must be deactivated before disposal. If these wastes cannot be disposed of according to label instructions, contact the Provincial Regulatory Agency or the Manufacturer. See also Section 15, SPILL AND LEAK PROCEDURES.

Do not contaminate water, food or feed by storage or disposal.

If properly exposed during the fumigation period, Magtoxin Prepac will contain virtually no unreacted magnesium phosphide. However, because of the short term of the spot treatment and because these fumigations are sometimes performed under cooler and drier conditions, it is required that all Magtoxin Prepac be subjected to further deactivation prior to ultimate disposal.

14.2 Product Container Disposal

The container must be cleaned prior to disposal. Appropriate respiratory protection (see Section 6, RESPIRATORY PROTECTION) must be worn at all times when levels of hydrogen phosphide are above 0.1 ppm during this process. While monitoring hydrogen phosphide levels or at any other time when hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn. The container should be cleaned in a secured and well-ventilated area or outdoors, away from inhabited buildings to prevent access by unauthorized personnel.

There are two options: 1) Triple rinse empty pails with water. Dispose of rinsate in a sanitary landfill, by pouring it out onto the ground or by other approved procedures. 2) Remove lids and expose empty pails to atmospheric conditions until residue in the pails is reacted.

Once the container is clean, it may be offered for recycling or reconditioning. Alternatively, it may be made unsuitable for further use by puncturing the container and disposed of in a sanitary landfill, or by other procedures approved by provincial and local authorities.

14.3 **Placarding During Deactivation of Unreacted Magtoxin Prepac Spot Fumigant**
IMPORTANT: Post warning placards on a suitable container used for deactivation (e.g. wire basket, bucket, drum, etc.) and around the fumigation zone perimeter before commencing deactivation. Relocating the placards may be required if the fumigation zone needs to be extended at any point during the deactivation period.

Posting of warning signs for the fumigation zone perimeter is required, UNLESS there is a physical barrier (e.g. fence) that prevents access into the fumigation zone. Signage must not be removed until after deactivation is completed. Only a licensed/certified applicator may authorize removal of warning signs.

Placards must be at least 28 cm long and 21 cm wide and made of substantial material that can be expected to withstand adverse weather conditions.

1. The signal word DANGER in letters at least 7cm high and the SKULL AND CROSSBONES symbol in red.
2. The "DO NOT WALK" symbol.
3. The statement "Access to area restricted due to deactivation of fumigant chemicals, DO NOT ENTER".
4. The statement, "This sign may only be removed after deactivation of fumigant chemicals is complete. "
5. The date and start time of the deactivation.
6. Name of fumigant used: *Degesch Magtoxin Prepac Spot Fumigant, Registration No. 26524.*
7. Contact information (name, address and telephone number) for the supervising fumigant handler in charge of the deactivation.
8. Placards must bear a 24-hour emergency response telephone number.

14.4 **Directions for Deactivation and Disposal of Partially Spent Magtoxin Prepacs**

Confinement of partially spent **Magtoxin®** Prepacs as in a closed container or plastic bag, may result in a fire hazard. Small amounts of hydrogen phosphide may be given off from unreacted magnesium phosphide, and confinement of the gas may result in a flash.

Spent or partially spent **Magtoxin** Prepacs may be collected for disposal in well-ventilated containers such as wire baskets (available from DEGESCH America, Inc. and DEGESCH CANADA) or porous cloth bags of burlap, cotton or other suitable material. **Caution:** Confinement and the danger of a flash may result from overfilling the ventilated or porous containers. It is preferable to carry out deactivation at the fumigation site. If this is not possible, the Prepacs may be loaded directly into open vehicles for transportation according to T.D.G.A. regulations, to the deactivation site. **Caution:** Protect the spent or partially spent Prepacs from contact with water as this might result in a flash. Do not pile the cloth bags together.

Magtoxin Prepac Spot Fumigant must always be further deactivated prior to ultimate disposal at a landfill. It may be deactivated using the wet or dry method. The deactivation site must be secured and placarded and only authorized persons should be allowed to enter the deactivation site. Deactivation should take place outdoors. Appropriate respiratory protection (see Section 6, RESPIRATORY PROTECTION) must be worn at all times when levels of hydrogen phosphide are above 0.1 ppm while handling partially spent residual dust. While monitoring hydrogen phosphide levels during deactivation or at any other time when hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn.

A fumigation zone must be established by the licensed/certified applicator around the deactivation site based on their expertise taking into consideration site characteristics and environmental conditions and warning placards must be posted to secure the site and prevent unauthorized persons from tampering with the deactivating material (see Section 14.3, Placarding During Deactivation of Unreacted Product).

14.5 **Deactivation of Spent and Partially-Spent Magtoxin® Prepac Spot Fumigant**

Partially spent **Magtoxin®** Prepacs must be further deactivated prior to transport for ultimate disposal. This is especially true in cases of incomplete exposure or following a fumigation which has produced large quantities of partially spent material.

- 14.5.1 **Spent or partially spent Magtoxin® Prepacs may be deactivated as follows using the "Wet Method."**
14.5.1.1 Water is used for deactivation of **Magtoxin®** Prepacs and other magnesium phosphide fumigants

by the “Wet Method”. **Detergent solution is not required for magnesium phosphide fumigants.** Fill a drum or other container to be used for wet deactivation with water to within 2 to 5 cm (1 to 2 inches) of the top. Do **not** allow a large headspace above the surface of the water.

14.5.1.2 Magnesium phosphide will react quite rapidly and very vigorously with liquid water. Therefore, small amount of partially spent material should be tested initially by immersion in water prior to proceeding with large scale wet deactivation. One or two individual Prepac should be evaluated first to determine their level of activity.

14.5.1.3 In a well-ventilated area, out of doors, submerge the entire Prepac in water. They may float to the surface and, therefore, it is necessary to hold them under water by use of a suitable weight. Caution: Partially spent Prepacs may ignite if they are allowed to float to the surface. Active **Magtoxin®** Prepacs should be submerged at least 10 to 15 cm to prevent smoking of the liberated hydrogen phosphide gas. **Magtoxin®** Prepacs may be placed in wire baskets for immersion in water. Do not cover the container being used for wet deactivation.

Adhere to provincial ambient air quality criteria standards and monitor downwind gas levels. Ensure that the deactivation area is secure and placarded to prevent public and unauthorized worker access.

14.5.1.4 Reaction of the magnesium phosphide with water is practically complete within about 15 to 30 minutes. However, **Magtoxin** Prepacs should be totally immersed for at least 6 hours to ensure total hydrolysis. **Caution:** Removal of Prepacs from water before they are largely deactivated may result in a fire. They may be taken to an approved site for disposal. Dispose of the water at a sanitary landfill or other approved site. Where permissible, the water may be poured out onto the ground. Do NOT directly pour into a storm sewer.

14.5.2 **Spent or partially Spent Magtoxin Prepacs may be Deactivated as Follows Using the “Dry Method”**

14.5.2.1 Extension of the fumigation period is the simplest method for further deactivation of partially spent **Magtoxin** Prepacs prior to ultimate disposal.

14.5.2.2 Alternatively, partially spent materials may be further deactivated by storing the **Magtoxin** Prepacs out of doors, protected from rain and ground water, in locked wire baskets or other similarly ventilated containers. As time permits, or when the container is full, the deactivated **Magtoxin** Prepacs may be taken to an approved site for disposal. Storage of partially spent **Magtoxin** Prepacs in a closed container may result in a fire hazard. Large numbers of partially spent Prepacs stored in open containers may ignite if contacted by water.

Adhere to provincial ambient air quality criteria standards and monitor downwind gas levels. Ensure that the deactivation area is secure and placarded to prevent public and unauthorized worker access.

15. **SPILL AND LEAK PROCEDURES**

15.1 **General Precautions**

A spill, other than incidental to application or normal handling, may produce high levels of hydrogen phosphide gas, and therefore, attending personnel must wear appropriate respiratory protection and personal protective equipment as specified below. Contact the manufacturer and the provincial regulatory agency in case of a spill and for clean-up of spills.

Directions for handling spills and leaks are provided below. Spills and leaks can be of two types:

- 1) spills and leaks in dry, non-wet areas;
- 2) spills into water.

15.2 **Spills and Leaks in Dry, Non-Wet Areas**

Personal Protective Equipment

Appropriate respiratory protection must be worn at all times when levels of hydrogen phosphide gas are above 0.1 ppm while attending to spills and leaks and during deactivation of incompletely reacted product. While monitoring hydrogen phosphide levels or at any other time when hydrogen phosphide levels are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn. Refer to Section 6, RESPIRATORY PROTECTION, and Section 9, APPLICATOR AND WORKER EXPOSURE, for additional details.

A fumigation zone must be established by the licensed/certified applicator around the location of the spill site based on their expertise taking into consideration site characteristics and environmental conditions. Entry by unprotected workers is only permitted after the hydrogen phosphide gas level is at or below 0.1 ppm in the site and the fumigation zone (Refer to Section 6, RESPIRATORY PROTECTION and Section 9, APPLICATOR AND WORKER EXPOSURE for additional details).

Wear a loose fitting long sleeve shirt, long pants, socks and shoes, and wear dry gloves of cotton or other breathable material when handling magnesium phosphide fumigants.

Directions for Handling Spills and Leaks in Dry, Non-Wet Areas

Unless directions specified below under “Deactivation by the Wet Method” are being followed, do **not** use water at any time to clean up a spill of **Magtoxin®** Prepac Spot Fumigant. Water, acids and other liquids in contact with magnesium phosphide products will greatly accelerate the production of hydrogen phosphide gas which could result in a toxic and/or fire hazard.

Return all intact magnesium phosphide products to their metal pails or other packaging which has been suitably constructed and marked according to T.D.G.A. regulations. Notify consignee and shipper of damaged cases.

1. If the foil pouches have been punctured or damaged so as to leak, they may be temporarily repaired with aluminum tape. Transport the damaged pouches, thus sealed, to an area suitable for pesticide storage for inspection. **Caution:** The punctured pouches may flash upon opening at some later time. When possible, open pouches outdoors. Do not open in an explosive environment (e.g. flour mill). Further instructions and recommendations may be obtained, if required, from DEGESCH America, Inc. or DEGESCH CANADA.
2. If foil pouches of **Magtoxin®** Prepacs have been damaged so severely that they cannot be temporarily repaired, these materials may be wet deactivated on site using the procedure described in Section 14.3. If on-site, wet deactivation is not feasible, the damaged containers should be transported in open vehicles to a suitable area. Wet deactivation may then be carried out as described in 14.3. Alternatively, spillage may be spread out in an open area away from inhabited buildings to be deactivated by atmospheric moisture. Care should be taken to ensure that the Prepacs are not carried away by the wind. If desired, they may be weighted down by 20 to 30 cm of sand or soil or by other suitable means. Do not use this procedure during periods of rain or if the soil is wet. After deactivation, the spent Prepacs may be gathered for disposal at approved sites.

15.3 Deactivation of Magtoxin® Prepac Spot Fumigant by the Wet Method

This is similar to the Sec. 14.5.1 (Wet deactivation of partially-spent Magtoxin Prepacs). The differences are that more water is required, and that any water which bubbles out of the drum is replaced.

Caution: Wear appropriate respiratory protection during wet deactivation of unexposed or incompletely exposed magnesium phosphide fumigants. Never place Prepacs or dust in a closed container such as a dumpster, sealed drum, plastic bag, etc., as flammable concentrations and a flash of hydrogen phosphide gas are likely to develop.

Appropriate respiratory protection (see Section 6, RESPIRATORY PROTECTION) must be worn at all times when levels of hydrogen phosphide are above 0.1 ppm while handling magnesium phosphide fumigants or dust and during deactivation of unreacted product. While monitoring hydrogen phosphide levels or at any other time when levels of hydrogen phosphide are unknown, appropriate respiratory protection, OR a personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm must be worn.

A fumigation zone must be established by the licensed/certified applicator around the deactivation site based on their expertise taking into consideration site characteristics and environmental conditions. Warning placards must be posted on a suitable container used for deactivation (e.g. bucket, drum, etc.) and around the fumigation zone perimeter before commencing deactivation in order to secure the site and prevent access by unauthorized personnel (see Section 14.3, Placarding During Deactivation of Unreacted Magtoxin Prepac Spot Fumigant). Relocating the placards may be required if the fumigation zone needs to be extended to any point during the deactivation period.

Water is used for the wet deactivation of Magtoxin Prepac Spot Fumigant and other magnesium phosphide fumigants. Detergent solution is not required. Fill several drums or other containers to be used for wet deactivation with water to within 2 to 5 cm (1 to 2 inches) of the top. Do not allow a large headspace above the surface of the

water.. Keep a water supply on hand to top-up the drum as necessary. Placards should be posted and the site secured to prevent unauthorized persons from tampering with the drums.

Magnesium phosphide reacts very vigorously with water and, therefore, only 1 or 2 unexposed Magtoxin Prepacs should be wet deactivated at one time. Add Prepacs to the deactivating solution slowly. Stir to thoroughly wet all of the product. This procedure should be done in the open air. **Magtoxin®** Prepacs should be mixed into no less than 57 litres of water/detergent solution for each case (21 kg) of material to be deactivated. Individual Prepacs should be cut from a roll of 5 connected Magtoxin Prepacs rather than attempting deactivation of an entire roll. Unexposed Prepacs will likely ignite if they are allowed to float to the surface of the water. They may be placed into wire baskets or similar containers, weighted and dropped into the water for deactivation. The Prepacs should be submerged to at least 10 to 15 cm (4 to 6 inches) to prevent smoking of the liberated hydrogen phosphide gas. Fill the drum with additional water to eliminate headspace. Do not cover the deactivating vessel at any time.

Reaction of magnesium phosphide with water is practically complete within about 15 to 30 minutes. However, the Magtoxin Prepacs should be totally immersed for at least 6 hours to ensure total hydrolysis. It is suggested that one or more drums or barrels (120 litres) be set up for the first half hour's immersion, until bubbling has practically ceased, after which the Magtoxin Prepacs are transferred to a second drum (120 litre) for the remainder of the wet deactivation period.

Caution: Removal of Magtoxin Prepacs from water before they are largely deactivated may result in fire. Deactivated Prepacs may then be taken to an approved sanitary landfill site for disposal.

Dispose of the slurry of completely deactivated material, with or without preliminary decanting, at an approved sanitary landfill. The deactivating solution may be poured onto the ground. Do not dispose of dust, slurry or deactivated solution by direct addition to sanitary or storm sewers.

15.4 Spills into Water

As releases into water can produce high levels of hydrogen phosphide gas, attending personnel must wear appropriate respiratory protection and personal protective equipment as specified below under EMERGENCY RESPONDER PROTECTION.

IMPORTANT: Emergency responders must be familiar with the "Emergency Response Guidebook", which is maintained by Transport Canada.

WHAT TO DO

In the event of an accidental release, evacuate the area immediately and call for assistance. A response into the spill area should only be attempted by trained emergency responders. As a reference, small and large spills may require isolation distances between 60-500 metres and may also require protective distances between 200 metres and 7.5 kilometres (refer to the "Emergency Response Guidebook").

HOT LINE NUMBER

Have the product container label or Applicator's Manual with you when calling a poison control centre, doctor, or when going for treatment. CONTACT 1-800-308-4856 FOR ASSISTANCE WITH HUMAN OR ANIMAL MEDICAL EMERGENCIES. You may also contact DEGESCH AMERICA, INC. – 540-234-9281 or DEGESCH CANADA – 514-852-3010. For all other chemical emergencies, please contact CHEMTREC – 1-800-424-9300 or Canadian Transport Emergency Centre (CANUTEC) 613-996-6666.

Emergency responders must follow the detailed specifications for magnesium phosphide (ID Number 1397, Guide Number 139) in the "Emergency Response Guidebook", which is maintained by Transport Canada (www.tc.gc.ca/eng/canutec/guide-menu-227.htm).

EMERGENCY RESPONDER PROTECTION

Wear a NIOSH-approved self-contained breathing apparatus (SCBA) with full face piece and operated in a pressure-demand or other positive-pressure mode OR a NIOSH-approved air-line respirator with a full face piece operated in a pressure-demand or other positive-pressure mode combined with an auxiliary self-contained positive-pressure breathing apparatus when the concentration of phosphine gas is unknown. If the concentration is known, other appropriate respiratory protection must be worn as specified in Section 6, RESPIRATORY PROTECTION.

All emergency responses should be made wearing personal protective equipment as specified in Section 5, PROTECTIVE CLOTHING, including chemical-resistant gloves (neoprene, butyl rubber or PVA), a Seranex coated Tyvek suit and rubber boots. Note that the chemical protective clothing listed may provide little or no thermal protection. Structural firefighters' protective clothing provides limited protection in fire situations only; it is not effective in spill situations where direct contact with the chemical is possible.

FOR ASSISTANCE, CONTACT:

DEGESCH AMERICA, INC.
153 Triangle Drive
P. O. Box 116
Weyers Cave, VA 24486 USA
Telephone: 540-234-9281/800-330-2525
Fax: 540-234-8225
Internet: www.degeschamerica.com
E-Mail: degesch@degeschamerica.com

OR

DEGESCH CANADA
8685 Rue Lafrenai
Saint-Leonard, QC
Canada H1P 2B6
Telephone: 514-852-3010

OR

HOT LINE NUMBER

Have the product container label or Applicator's Manual with you when calling a poison control centre, doctor, or when going for treatment. **CONTACT 1-800-308-4856 FOR ASSISTANCE WITH HUMAN OR ANIMAL MEDICAL EMERGENCIES.** You may also contact DEGESCH AMERICA, INC. 540-234-9281/1-800-330-2525 or, DEGESCH CANADA 514-852-3010. For all other chemical emergencies, please contact CHEMTREC – 1-800-424-9300 or Canadian Transport Emergency Centre (CANUTEC) 613-996-6666.