

MATERIAL SAFETY DATA SHEET

WEEVIL-CIDE® TABLETS/WEEVIL-CIDE® PELLETS

Revision 3

Date Issued: 12/7/04

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company: United Phosphorus, Inc.
423 Riverview Plaza
Trenton, NJ 08611
Phone number: 1-800-247-1557 or www.upi-usa.com
Name used on labels: WEEVIL-CIDE® Tablets, WEEVIL-CIDE® Pellets
Product use: Fumigant

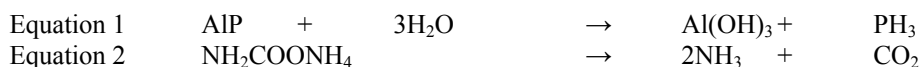
FOR MEDICAL EMERGENCIES, contact the National Pesticide Information Center at 1-800-247-1557
FOR CHEMICAL EMERGENCY: Spill, leak, fire, exposure, or accident, call CHEMTREC 1-800-424-9300

AN APPROVED APPLICATOR'S MANUAL ACCOMPANIES THESE PRODUCTS. REFER TO THE APPLICATOR'S MANUAL FOR DETAILED PRECAUTIONS, RECOMMENDATIONS AND DIRECTIONS FOR USE.

WEEVIL-CIDE is a Registered Trade Mark of United Phosphorus, Inc.

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

WEEVIL-CIDE Tablets and Pellets contain aluminum phosphide which reacts with water to produce phosphine gas (PH₃); hydrogen phosphide) as show in Equation 1. WEEVIL-CIDE is formulated with 60% aluminum phosphide and also contains ammonium carbamate and other inert ingredients. Ammonium carbamate releases ammonia and carbon dioxide as shown in Equation 2.



Identity	CAS #	Identity	CAS #
Aluminum Phosphide	20859-73-8	NH ₂ COONH ₄	111-78-0
PH ₃	7803-51-2	NH ₃	7664-41-7
Al(OH) ₃	21645-51-2	CO ₂	124-38-9

SECTION 3 HAZARDS IDENTIFICATION

Physical hazards: Dangerous when wet
Health hazards: Poison
Nature of Hazard: Primary Route(s) of Entry: inhalation, ingestion
Read the entire MSDS for a more thorough evaluation of hazards.

SECTION 4 FIRST AID MEASURES

DANGER: WEEVIL-CIDE® Tablets, Pellets or dust can be fatal if swallowed. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke while handling aluminum phosphide fumigants. When a sealed container is opened, allowing material to come in contact with moisture, water or acids, toxic phosphine gas will be released. Pure phosphine gas is odorless but a garlic odor may be detected due to a contaminant. Since an odor may not be detected under certain circumstances, the absence of a garlic odor does not mean that phosphine gas is absent. Observe proper application, aeration, re-entry and disposal procedures specified elsewhere in the labeling to prevent overexposure. Symptoms of exposure to this product are headaches, dizziness, nausea, difficult breathing, vomiting, and diarrhea. In all cases of overexposure get medical attention immediately. Take victim to a doctor or emergency treatment facility.

IF INHALED:

Move person to fresh air. If person is not breathing, call 911 or an ambulance, begin artificial respiration immediately, preferably by mouth-to-mouth. Keep warm and make sure person can breathe freely. Contact a poison control center or doctor for treatment advice. Do not give anything by mouth to an unconscious person.

IF SWALLOWED:

Call a Poison control center or doctor immediately for treatment advice. Have person drink one or two glasses of water and induce vomiting by touching back of throat with finger, or if available administer syrup of ipecac. Do not give anything by mouth to an unconscious person.

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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.

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 center or doctor for treatment advice.

Note to Physician: Aluminum phosphide in WEEVIL-CIDE® Tablets and Pellets reacts with moisture from the air, water, acids and many other liquids to release hydrogen phosphide (phosphine) gas. Mild exposure by inhalation causes malaise (indefinite feeling of sickness), ringing of ears, fatigue, nausea, and pressure in the chest, which is relieved by removal to fresh air. Moderate poisoning causes weakness, vomiting, pain just above the stomach, chest pain, diarrhea and dyspnea (difficulty in breathing). Symptoms of severe poisoning may occur within a few hours to several days, resulting in pulmonary edema (fluid in lungs) and may lead to dizziness, cyanosis (blue or purple skin color), unconsciousness, and death. In sufficient quantity, phosphine affects the liver, kidneys, lungs, nervous system and circulatory system. Inhalation can cause lung edema (fluid in lungs) and hyperedemia (excess of blood in a body part), small perivascular brain hemorrhage and brain edema (fluid in brain). Ingestion can cause lung and brain symptoms but damage to the viscera (body cavity organs) is more common. Phosphine poisoning may result in (1) pulmonary edema, (2) liver elevated serum GOT, LDH and alkaline phosphatase, reduced prothrombin, hemorrhage and jaundice (yellow skin color) and (3) kidney hematuria (blood in urine) and anuria (abnormal lack of urination). Pathology is characterized by hypoxia (oxygen deficiency in blood tissue). Frequent exposure to subacute concentrations over a period of days or weeks may cause poisoning. Treatment is symptomatic.

SECTION 5 FIRE FIGHTING MEASURES

Flash point:	Aluminum phosphide is not flammable. However, it reacts readily with water to produce hydrogen phosphide (phosphine, PH ₃) gas which may ignite spontaneously at air concentrations above the LEL of 1.8% v/v.
Flammable limits (STP):	Lower, 1.8% v/v
Extinguishing Media:	Suffocate flames with sand, carbon dioxide or dry extinguishing materials. Ventilate the area to reduce the concentration below flammable limits.
Special Fire-Fighting Procedures:	DO NOT USE WATER ON METAL PHOSPHIDE FIRES.
Protective Equipment:	Wear a NIOSH/MSHA-approved self-contained breathing apparatus or equivalent respiratory protection. Wear gloves when handling WEEVIL-CIDE tablets or pellets.
Unusual Fire and Explosion Hazards:	Hydrogen phosphide (phosphine)-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 personal injury. <u>Never allow the buildup of hydrogen phosphide to exceed explosive concentrations.</u> Containers of metal phosphides should be opened in open air only and never in a flammable atmosphere. Do not confine spent or partially spent dust from metal phosphide fumigants since the slow release of hydrogen phosphide from these materials may result in formation of an explosive atmosphere. Spontaneous ignition may occur if large quantities of aluminum phosphide are piled in contact with liquid water. Fires containing hydrogen phosphide or metal phosphides will produce phosphoric acid by the following reaction: $2\text{PH}_3 + 4\text{O}_2 \rightarrow \text{H}_2\text{O} + \text{P}_2\text{O}_5 \rightarrow 2\text{H}_3\text{PO}_4$
NFPA RATING	Health Hazard 4 Flammability Hazard 4 Reactivity Hazard 2 Special Hazard W/Dangerous when Wet

SECTION 6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS (SEE EPA APPLICATOR MANUAL FOR ADDITIONAL DETAILS):

Steps to be taken in case material is released or spilled:

The use pattern usually precludes disposal. A spill, other than incidental to application or normal handling, may produce high levels of gas. A NIOSH/MSHA approved full-face gas mask – hydrogen phosphide canister combination (if

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exposed to levels up to 15 ppm) or a Self Contained Breathing Apparatus (SCBA) (if exposure is unknown or above 15 ppm) must be worn during wet deactivation of partially spent material. Wear dry cotton or other gloves when handling tablets or pellets.

METHODS FOR CLEANING UP AND DISPOSAL:

Do not use water at any time to clean up a spill of WEEVIL-CIDE® Tablets or Pellets. Water in contact with unreacted WEEVIL-CIDE® Tablets and Pellets will greatly accelerate the production of hydrogen phosphide gas which could result in a toxic and/or fire hazard. Wear gloves of cotton or other material when handling aluminum phosphide. Do not cover the container being used for wet deactivation. Do not dispose of WEEVIL-CIDE dust in a toilet.

If aluminum flasks have been punctured or damaged so as to leak, the container may be temporarily repaired with aluminum tape or the WEEVIL-CIDE® Tablets or Pellets may be transferred from the damaged flask to a sound metal container which should be sealed and properly labeled as aluminum phosphide. Transport the damaged containers to an area suitable for pesticide storage for inspection. Refer to the Applicator's Manual for more detailed Spill and Leak procedures. Partially spent WEEVIL-CIDE Tablets or Pellets and residual dust from phosphine fumigations may be treated by the "wet" deactivation method as follows:

1. Deactivating solution is prepared by adding low sudsing detergent or surface-active agent to water in a drum or other suitable container. A 2% solution or 4 cups in 30 gallons is suggested. The container should be filled with deactivating solution to within a few inches of the top.
2. The Tablets or Pellets should be poured slowly into the deactivating solution and stirred so as to thoroughly wet all of the WEEVIL-CIDE. This should be done in the open air. WEEVIL-CIDE Tablets or Pellets should be mixed into no less than about 15 gallons of water-detergent solution for each case of material. Wear appropriate respiratory protection during wet deactivation.
3. Allow the mixture to stand, with occasional stirring, for about 36 hours. If properly exposed, the residual dust remaining after deactivation or fumigation will be a grayish-white, spent, non-hazardous waste which, according to RCRA regulations, can be disposed of at a sanitary landfill. Some local or state regulations may vary, so disposal procedures should be reviewed with appropriate authorities. Where permissible, this slurry may be poured into a storm sewer or out onto the ground. In case of emergency call CHEMTREC, 1-800-424-9300. The EPA has determined that proper disposal of aluminum phosphide will cause no unreasonable adverse effects to the environment.

SECTION 7 HANDLING AND STORAGE

REQUIREMENTS FOR STORAGE ROOMS:

Containers should be stored in a cool, dry, well-ventilated area away from heat, under lock and key. Post as a pesticide storage area. Exercise due caution to prevent damage to or leakage from the container.

ADDITIONAL INFORMATION:

Do not store near feed, food. Do not store in buildings where humans or domestic animals reside. Keep out of reach of children. WEEVIL-CIDE® Tablets and Pellets are supplied in gas-tight, resealable aluminum flasks. It is recommended that aluminum phosphide products are opened in open air or near a fan, which exhausts outside immediately. Never open in flammable atmosphere because on rare occasions it may flash. When opening, point the container away from the face and body. These precautions will also reduce the applicators exposure to hydrogen phosphide (phosphine) gas. Do not expose the product to atmospheric moisture any longer than is necessary and seal tightly before returning flasks to storage.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limits

	OSHA PEL	ACGIH TLV	
	TWA (ppm)	TWA, (ppm)	STEL (ppm)
Hydrogen Phosphide*	0.3	0.3	1.0
Ammonia	50	25	35
Carbon Dioxide	5,000	5,000	30,000

*EPA limits are 0.3 ppm TWA during fumigation and 0.3 ppm ceiling at all other times.

RESPIRATORY PROTECTION: A NIOSH/MSHA-approved full face mask with approved canister for phosphine (hydrogen phosphide, PH₃) may be worn at concentrations up to 15 ppm. At levels above this or when the hydrogen phosphide concentration is unknown, NIOSH/MSHA-approved SCBA or equivalent must be worn.

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EYE PROTECTION: None required. However, eye contact with the material should be avoided through the use of chemical safety glasses, goggles or a faceshield, selected in regard to exposure potential.

BODY PROTECTION: This product is FIFRA regulated. Refer to product labeling and Applicator Manual for end-user Personal Protection requirements. Skin contact should be prevented through the use of dry cotton gloves or other material if contact with powdered formulation is likely. Remove contaminated clothing and wash before rewearing. Wash separately from other laundry.

VENTILATION: Local ventilation is generally adequate to reduce hydrogen phosphide levels in fumigated areas to below the TWA. Exhaust fans may be used to speed the aeration of silos, warehouses, shipholds, containers, etc.

WORK/HYGIENE PRACTICES: Do not breathe dust. Do not get in eyes or on hands, skin or clothing. Do not eat, drink or smoke while handling. Wash hands thoroughly with soap and water after handling. An OSHA-respiratory protective program should be instituted. An SCBA must be available during application from within the site being fumigated but needn't be on the premises. However, some type of NIOSH/MSHA approved respiratory protection must be immediately available. Worker exposure must be adequately characterized initially and followed by occasional monitoring. OSHA recommends that the exposure screening of employees be conducted to detect impaired pulmonary function and that any employees developing the above conditions be referred for medical attention.

Other protective equipment: Equipment for detection of phosphine should be used. An adequate supply of clean potable water should be available to allow thorough flushing of skin and eyes in event of contact with this compound.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Aluminum phosphide WEEVIL-CIDE® Tablets and Pellets and partially spent dust will release hydrogen phosphide if exposed to moisture from the air or if it comes into contact with water, acids and many other liquids. Piling of WEEVIL-CIDE® Tablets, Pellets or dust from their fragmentation may cause a temperature increase and confine the release of gas so that ignition could occur. Pure hydrogen phosphide (phosphine) gas is practically insoluble in water, fats and oils, and is stable at normal fumigation temperatures. However, it may react with certain metals and cause corrosion, especially at higher temperatures and relative humidities. Metals such as copper, brass, and other copper alloys, and precious metals such as gold and silver are susceptible to corrosion by phosphine. Thus items such as small electric detectors, brass sprinkler heads, batteries and battery chargers, forklifts, temperature monitoring systems, electrical switchgear, communication devices, computers, calculators, watches, and other electronic equipment should be protected or removed before fumigation. Hydrogen phosphide will also react with certain metallic salts and, therefore such items as photographic film, copying papers and some inorganic pigments, etc. should not be exposed.

Form:	Aluminum phosphide, solid (produces phosphine gas)
Color:	gray-green (phosphine gas is colorless)
Odor:	Phosphine gas: carbide, garlic, decaying fish
Vapor Pressure:	Aluminum phosphide, 0 mm Hg; Phosphine gas, 33.5 mm Hg (68°F)
Specific gravity of Vapors:	Phosphine gas, 1.17
Specific gravity:	Aluminum phosphide, 2.85
Water Solubility:	Aluminum phosphide is insoluble; Phosphine gas is slightly soluble

SECTION 10 STABILITY AND REACTIVITY

HAZARDOUS REACTIONS (CONDITIONS TO AVOID)

Stability: Aluminum phosphide is stable to most chemical reactions except for hydrolysis. It will react with moist air, liquid water, acids and some other liquids to produce toxic and flammable hydrogen phosphide gas. Hydrogen phosphide may react vigorously with oxygen and other oxidizing agents. The shelf life of Weevil-Cide® is virtually unlimited if the containers are tightly sealed.

Incompatibility: Avoid contact with water and oxidizing agents.

Corrosion: Hydrogen phosphide gas may react with certain metals (gold, silver, copper, brass, other precious metals and their alloys) and cause corrosion especially at higher temperatures and relative humidities.

Hazardous Polymerization: Will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS

Formation of phosphine gas when contacted by moisture in the air, water or some liquids.

SECTION 11 TOXICOLOGICAL INFORMATION

The dermal toxicity of aluminum phosphide is low with an LD₅₀ > 5,000 mg/kg for a 1-hour exposure. Aluminum phosphide is acutely toxic with an acute oral LD₅₀ of 11.5 mg/kg. Phosphine gas is acutely toxic based on an acute inhalation LC₅₀ of 190 ppm for a 1-hour exposure. Aluminum phosphide and phosphine gas are not known to cause chronic toxicity.

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Effects of Over-exposure: Symptoms of exposure to this product are headaches, dizziness, nausea, difficult breathing, vomiting, and diarrhea. Mild exposure by inhalation causes malaise (indefinite feeling of sickness), ringing of ears, fatigue, nausea, and pressure in the chest, which is relieved by removal to fresh air. Moderate poisoning causes weakness, vomiting, pain just above the stomach, chest pain, diarrhea and dyspnea (difficulty in breathing). Symptoms of severe poisoning may occur within a few hours to several days, resulting in pulmonary edema (fluid in lungs) and may lead to dizziness, cyanosis (blue or purple skin color), unconsciousness, and death. In all cases of overexposure get medical attention immediately. Take victim to a doctor or emergency treatment facility.

Carcinogenic potential: Not listed, NTP - LARC -OSHA

SECTION 12 ECOLOGICAL INFORMATION

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

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal Method: Do not contaminate water, food or feed by storage or disposal. Unreacted or partially reacted WEEVIL-CIDE® is acutely hazardous. Improper disposal of excess pesticide is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. For specific instructions, see Section 6. Some local and state waste disposal regulations may vary therefore disposal procedures must be reviewed with appropriate authorities to ensure compliance with these regulations. Contact your state Pesticide or Environmental Control Agency or Hazardous Waste guidance. Discarded product is not a hazardous waste under RCRA, 40 CFR 261.

Container disposal: Dispose of empty cans in a sanitary landfill or other approved site, or by other procedures approved by state and local authorities.

SECTION 14 TRANSPORT INFORMATION

DOT SHIPPING DESCRIPTION: Aluminum phosphide mixture, 4.3, UN 1397, PG I, dangerous when wet, poison.

DOT PLACARDING: Dangerous when wet (any quantity)

SECTION 15 REGULATORY INFORMATION

SARA: Section 302 -aluminum phosphide (ALP) is listed as an extremely hazardous substance. The threshold planning quantity is 500 lbs ALP (226.8 kg) i.e. 11,136 bags contain 500 lbs of ALP.

OSHA HAZARD COMMUNICATION HAZARDS:

Immediate health hazard (highly toxic), reactivity, fire

CERCLA REPORTABLE QUANTITY:

Spill of 100 lbs (45 kg) aluminum phosphide 2,227 bags contain 100 lbs ALP

SECTION 16 OTHER INFORMATION

ABBREVIATIONS

TWA = Time Weighted Average

TLV = Threshold Limit Value

OSHA = Occupational Safety and Health Administration

STEL = Short Term Exposure Limit

PEL = Permissible Exposure Limit

ACGIH = American Conference of Governmental Industrial Hygienists

THIS INFORMATION IN THIS MSDS IS BASED ON DATA AVAILABLE AS OF THE REVISION DATE GIVEN HEREIN, AND BELIEVED TO BE CORRECT. CONTACT UNITED PHOSPHORUS, INC. TO CONFIRM IF YOU HAVE THE MOST CURRENT MSDS. JUDGMENTS AS TO THE SUITABILITY OF THE INFORMATION HEREIN FOR THE INDIVIDUAL'S OWN USE OR PURPOSES IS NECESSARILY THE INDIVIDUAL'S OWN RESPONSIBILITY. ALTHOUGH REASONABLE CARE HAS BEEN TAKEN IN THE PREPARATION OF SUCH INFORMATION, UNITED PHOSPHORUS, INC. EXTENDS NO WARRANTIES, MAKES NO REPRESENTATIONS, AND ASSUMES NO RESPONSIBILITY AS TO THE ACCURACY OR SUITABILITY OF SUCH INFORMATION FOR APPLICATION TO THE INDIVIDUAL'S PURPOSES OR THE CONSEQUENCES OF ITS USE.

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

MSDS Revision: Revision 3 replaces Version 2. Reasons for revision: update company and emergency contact information