United Phosphorus, Inc.

Safety Data Sheet

Preparation Date 04-Aug-2015 **Revision date** 12-Aug-2015 **Revision Number:** 1

1. Identification of the Substance/Preparation and of the Company/Undertaking

Product identifier
Product Description: Magnaphos Plates

Other means of identification
Item#: 12-MAG2
UN-No UN2011
Synonyms Not Available
Registration number(s) 70506-309

Recommended use of the chemical and restrictions on use
Recommended use Restricted Use Pesticide. Fumigant.
Uses advised against Activties contrary to label recomendation

Details of the Supplier of the Safety Data Sheet
Supplier Address
UPI
630 Freedom Business Center
Suite 402
King of Prussia, PA 19406
Emergency telephone number
Company Phone Number 1-800-438-6071
Emergency telephone number Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 673-6671 (24hrs)

2. Hazards Identification

Classification

OSHA Regulatory Status
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 2
Acute toxicity - Inhalation (Gases)	Category 1
Acute toxicity - Inhalation (Vapors)	Category 1

Label elements

EMERGENCY OVERVIEW

DANGER

hazard statements
Fatal if inhaled
FATAL IF SWALLOWED
Harmful in contact with skin

appearance dark gray	**Physical state** solid Plate	**Odor** Pure phosphine gas is odorless but a garlic odor might be detected due to a contaminant. Since odor may not be detected under certain circumstances, the absence of a garlic odor does not mean that phosphine gas is absent.

Precautionary Statements - Prevention
Do not eat, drink or smoke when using this product
Do not handle until all safety precautions have been read and understood
Protect from moisture
Wear eye/face protection
Wear protective gloves
Wash hands thoroughly after handling

IF INHALED
Immediately call a POISON CENTER or doctor/physician
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth

Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal
Refer to manufacturer/supplier for information on recovery/recycling

Hazards Not Otherwise Classified (HNOC)
OTHER INFORMATION
• Very toxic to aquatic life
• May be harmful in contact with skin

3. Composition/information on Ingredients

Chemical name	CAS-No	Weight %	Trade secret
Magnesium phosphide	12057-74-8	56.0 (a.i.)	

If CAS number is "proprietary", the specific chemical identity and percentage of composition has been withheld as a trade secret.

4. First aid measures

FIRST AID MEASURES

Eye contact Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

Skin contact Take off contaminated clothing. Wash off immediately with plenty of water for at least 15 minutes. Call a poison control center or doctor for treatment advice.

Inhalation Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

Ingestion Call a physician or poison control center immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Vomiting may off-gas and release phosphine, which could pose a risk of secondary contamination.

Protection of First-aiders Use personal protective equipment.

Most Important Symptoms and Effects, Both Acute and Delayed

Most Important Symptoms and Effects Headache. Diarrhea. Nausea. Difficulty in breathing. Dizziness.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to physician Magnesium phosphide- This material reacts with moisture from air, water, acids, and manyother liquids to release hydrogen phopshide (phosphine) gas. Symptoms of severe poisoning may occur within a few hours to several days. Phosphine poisoning may result in pulmnary edema, liver elevated serum, GOT, LDH and alkaline phosphatase reduced prothrombin, hemmorahage and jaundice and kidmey hematuria. Pathology is characterized by hypoxia.
Mild inhalation exposure causes malaise, ringing of ears, fatigue, nausea, and pressure in the chest, which is relieved by removal to fresh air. Moderate poisoning causes weakness, vomiting, and pain just above the stomach, chest pain, diarrhea and dyspnea. Symptoms of severe poisoning may occur within a few hours to several days, resulting in pulmonary edema and may lead to dizziness, cyanosis, unconsciousness and death.
In sufficient quantity, phosphine affects the liver, kidneys, lungs, nervous system, and circulatory system. Inhalation can cause lung edema, and hyperemia. Ingestion can cause lung and brain symptoms but damage to the viscera 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 and (3) kidney hematuria and anuria. Pathology is characterized by hypoxia. Frequent exposure to subacute concentrations over a period of days or weeks may cause poisoning. Treatment is symptomatic.
The following measures are suggested for use by the physician in accordance with his own judgement.
In its milder forms, symptoms of poisoning may take some time, up to 24 hours, to make their appearance and the following is suggested:
1) Give complete rest for 1 -2 days during which the patient must be kept quiet and warm.
2) Should patient suffer from vomiting or increased blood sugar, appropriate solution should be administered. Treatment with oxygen breathing equipment is recommended as is the administration of cardiac and circulatory stimulants.
In cases of severe poisoning (Intensive Care Unit recommended) :
1) Where pulmonary edema is observed, steroid therapy should be considered and close medical supervision is recommended. Blood transfusions may be necessary.
2) In cases of pulmonary edema, venesection should be performed under vein pressure control. Heart glycosides (IV) can be used in case of hemoconcentration.
Venesection may result in shock. Upon progressive edema of the lungs, immediate intubation with constant removal of edema fluid and oxygen over pressure respiration, as well as measures required for shock treatment are recommended. In case of kidney failure, extracorporeal hemodialysis is necessary. There is no specific antidote for this poison.
3) Mention should be made here of suicidal attempts by taking solid phosphine by mouth. After swallowing emptying of the stomach by vomiting, flushing the stomach with diluted potassium permanganate solution or solution of manganese peroxide until flushing liquid ceases to smell of carbide, is recommended. Thereafter apply medicinal charcoal.

5. Fire-fighting measures

Suitable extinguishing media
Carbon dioxide (CO2).
Use:. Dry chemical. alcohol-resistant foam.
Magnesium phosphide is not flammable; however, it reacts with water to produce hydrogen phosphide (phosphine) gas which may ignite spontaneously at concentrations above the LEL of 1.8% v/v.

Unsuitable extinguishing media Water. Water spray.

Specific hazards arising from the chemical
Thermal decomposition can lead to release of irritating gases and vapours.

Metal phosphides: 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. NEVER allow build up of hydrogen phosphide to exceed explosive concentrations. Containers of metal phosphides should be opened in open air and never in a flammable atmosphere. Do not confine spent or partially spent dust as slow release of hydrogen phosphide 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 metal phosphides or hydrogen phosphide will produce phosphoric acid by the following reaction: 2PH3 + 4O2 = H2O + P2O5 = 2H3PO4.

Hazardous combustion products Phosphine gas.

Explosion data

Protective equipment and precautions for firefighters

Use personal protective equipment. As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal Precautions	Avoid contact with the skin and the eyes. An accidental spill/release of material may produce high levels of gas. A NIOSH/MSHA approved full face gas mask with phosphine cartridge of SCBA must be employed during wet deactivation of partially spent material. Wear protective gloves and clothing. Wear protective gloves/clothing and eye/face protection.

Environmental Precautions

Environmental precautions	Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinenet environmental permits.

Methods and material for containment and cleaning up

Methods for Clean-Up	Damaged plates should be transferred, only by individuals who are knowledgeable of magnesium phosphide properties and who employ protective gloves and appropriate respiratory protection, to a sound metal container for transfer to a secure location.

7. Handling and Storage

Precautions for safe handling

Handling	Do not eat, drink or smoke when using this product. Keep out of reach of children. Read label, manual and safety data sheet BEFORE handling. Always employ protective gloves, clothing and appropriate respiratory protection. It is recommended that product be opened in air or near a fan that exhausts outside immediately. Never open in a flammable atmosphere to avoid, although rare, flash. When opening point away form face and body. Do not expose to atmospheric moisture any longer than necessary.

Conditions for safe storage, including any incompatibilities

Storage	Store in a secure area. Keep out of the reach of children. Keep containers tightly closed in a cool, well-ventilated place. Keep in properly labelled containers. Keep away from heat. Store in accordance with the particular national regulations. Store in accordance with local regulations.
incompatible materials	Water. Hydrogen phosphide may react with certain metals (gold, silver, brass, other precious metals and their alloys) and cause corrosion especially at high temperatures and relative humdities. Small electric detectors, brass sprinkler heads, batteries and battery chargers, forklifts, temperature monitoring systems, electrical switch gear, communication devices, computers, calculators, watches and other electronic equipments shoul dbe protected or removed before fumigation. Hydrogen phosphide gas 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.

8. Exposure Controls/Personal Protection

Exposure guidelines Guidelines for phosphine gas.

Engineering controls Measurements of the concentration of Magnesium phosphide in the air must be provided and used to verify the concentration in the atmosphere.

Personal protective equipment

Eye/Face Protection Use eye protection to avoid eye contact. Where there is potential for eye contact have eye flushing equipment available. Safety glasses with side-shields.

Skin protection Impervious butyl rubber gloves. Wear protective gloves/clothing. Socks and footwear.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. In case of inadequate ventilation wear respiratory protection. A NIOSH/MESA approved full face mask with approved canister for phosphine may be employed for concentrations up to 15 ppm. At concentrations above that level, or when concentration is unknown, NIOSH/MESA approved SCBA or equivalent must be worn.

General hygiene considerations

Do not eat, drink or smoke when using this product. Wear respiratory protection. Wear suitable gloves and eye/face protection. Remove and wash contaminated clothing before re-use. Wash hands before breaks and immediately after handling the product.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state	solid Plate		
appearance	dark gray	**Odor**	Pure phosphine gas is odorless but a garlic odor might be detected due to a contaminant. Since odor may not be detected under certain circumstances, the absence of a garlic odor does not mean that phosphine gas is absent.
color	No information available		

Property	**VALUES**	**Remarks/ • Method**
pH	No information available	
Melting point/freezing point	No information available	
Boiling Point/Range	No information available	
Flash Point		
Evaporation Rate	No information available	
flammability (solid, gas)	No information available	
Flammability limit in air		
Upper Flammability Limit	No information available	
Lower Flammability Limit	No information available	
vapor pressure	No information available	
Vapor Density	No information available	
Specific gravity	No information available	
Water solubility	No information available	
Solubility in Other Solvents	No information available	
Partition coefficient: n-octanol/water	No information available	
Autoignition temperature	No information available	
decomposition temperature	No information available	
Viscosity, kinematic	No information available	
Dynamic viscosity	No information available	

Explosive properties	No information available
Oxidizing properties	No information available

OTHER INFORMATION

Softening point	No information available
molecular weight	No information available
VOC Content	No information available
density	No information available
Bulk density	0.61 mg/L

10. Stability and Reactivity

Reactivity
Water reactive

Chemical stability
Stable under normal conditions.
Reacts with water to form hydrogen phosphide (phosphine) gas.
Possibility of hazardous reactions
None under normal processing.
Hazardous polymerization Hazardous polymerisation does not occur.

Conditions to avoid
Protect from moisture. Elevated temperatures, moisture and oxygen break down the product and induce flammable and toxic gas.
incompatible materials
Water. Hydrogen phosphide may react with certain metals (gold, silver, brass, other precious metals and their alloys) and cause corrosion especially at high temperatures and relative humdities. Small electric detectors, brass sprinkler heads, batteries and battery chargers, forklifts, temperature monitoring systems, electrical switch gear, communication devices, computers, calculators, watches and other electronic equipments shoul dbe protected or removed before fumigation. Hydrogen phosphide gas 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.
Hazardous decomposition products
Phosphine gas.

11. Toxicological Information

Information on Likely Routes of Exposure

Product information

Magnaphos plate:
Acute oral LD50 (rat) = >5-50 mg/kg
Acute dermal LD50 (rat) = 2633.05 mg/kg
Acute inhalation LC50 (rat) = 50 ppm (1 hour)
Eye irritation = Irreversible corneal opacity
Skin sensitization = Not a sensitizer

Inhalation	Poison - may be fatal if inhaled.
Eye contact	Avoid contact with eyes. Contact with eyes may cause irritation.
Skin contact	May be absorbed through the skin in harmful amounts.
Ingestion	FATAL IF SWALLOWED.

Information on Toxicological Effects

Symptoms No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

sensitization	No information available.
Mutagenic effects	No information available.
Carcinogenicity	There are no known carcinogenic chemicals in this product.
Reproductive effects	Not Available.
STOT - Single Exposure	No information available.
STOT - repeated exposure	No information available.
Chronic toxicity	Avoid repeated exposure.
Target organ effects	Respiratory System, EYES, skin.
Aspiration hazard	No information available.

Numerical Measures of Toxicity - Product information

LD50 Oral	< 50 mg/kg (rat)
LD50 Dermal	2633.5 mg/kg (rat)
LC50 Inhalation:	Inhalation LC50 50 ppm (1 hr)

12. Ecological Information

ecotoxicity

Highly toxic to wildlife

Persistence/Degradability
No information available.

Bioaccumulation/ Accumulation
Does not bioaccumulate.

Other Adverse Effects
No information available

13. Disposal Considerations

Waste Treatment Methods

Waste Disposal Method	Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide or rinsate is a violation of Federal law. If the wastes cannot be disposed of by use or 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. Follow label for proper disposal instructions.
Contaminated packaging	Refer to product label.

14. Transport Information

DOT

UN-No	UN2011
Proper shipping name	Magnesium phosphide
Hazard class	4.3
Subsidiary class	(6.1)
Packing group	PG I

ICAO

UN-No	UN2011

Proper shipping name	Magnesium phosphide
Hazard class	4.3
Subsidiary class	(6.1)
Packing group	PG I

IATA

UN-No	UN2011
Proper shipping name	Magnesium phosphide
Hazard class	4.3
Subsidiary class	(6.1)
Packing group	PG I

IMDG/IMO

UN-No	UN2011
Proper shipping name	Magnesium phosphide
Hazard class	4.3
Subsidiary class	(6.1)
Packing group	PG I

15. Regulatory Information

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

signal word DANGER!

Ventilation Control Measurements of the concentration of magnesium phosphide must be provided and used to verify the concentration in the atmosphere.

Restricted Use Pesticide. Due to inhalation toxicity of phosphine gas. Keep out of Reach of Children. For burrowing rodent application: The use of this product is strictly prohibited within 100 feet of any building where humans and/or domestic animals do or may reside, on single or multi family residential properties and nursing homes, schools (except athletic fields) , day care facilities, and hospitals. May be fatal if swallowed. Toxic to wildlife.

International Inventories

USINV	Not determined
DSL/NDSL	Not determined
EINECS/ ELINCS	Does not comply
ENCS	Does not comply
China	Does not comply
KECL	Complies
PICCS	Complies
AICS	Complies
TSCA	Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and and Title 40n of the Code of Federal Regulations, Part 372:

SARA 311/312 Hazardous Categorization

Acute health hazard	yes
Chronic health hazard	yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	yes

CERCLA

SARA Product RQ 0

RCRA

Pesticide Information

Component	FIFRA - Restricted Use	FIFRA - Pesticide Product Other Ingredients	FIFRA - Listing of Pesticide Chemicals	California Pesticides - Restricted Materials
Magnesium phosphide 12057-74-8 (56.0 (a.i.))			X	Present

State Regulations

State Right-to-Know

Chemical name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Magnesium phosphide	X	X			

International regulations

U.S. EPA Label information

EPA Pesticide registration number 70506-309

16. Other Information

NFPA **HEALTH** 4 **flammability** 2 **Instability** 0 **Physical hazard** -

Preparation Date 04-Aug-2015
Revision date 12-Aug-2015
Revision Summary
Update section 3

End of MSDS