

MATERIAL SAFETY DATA SHEET

MAGTOXIN[®] FUMIGATION PELLETS

OTHER NAMES	Magnesium Phosphide
PRODUCT CODE	7000/7001
U.N. NO	2011
DANGEROUS GOODS CLASS	4.3 & 6.1
HAZCHEM	4WE
PACKAGING GP	I

1 IDENTIFICATION

Magtoxin reacts with water to produce phosphine gas.

Magtoxin is formulated with 66% magnesium phosphide and also contains ammonium carbamate and inert ingredients. Ammonium carbamate releases ammonia and carbon dioxide as follows:

Magtoxin is available as 0.6g pellets and 3.0g tablets. Products are packed in gas-tight aluminium flasks.

1.1 PHYSICAL DESCRIPTION/PROPERTIES

	Mg ₁ P ₁	PH ₁		Mg ₁ P ₁	PH ₁
Specific Gravity (water=1)	2.06		Melting Point (C)	>1000	-133.5
Rel Vapour Density (air = 1)	N/A	1.17	Boiling Point (C)	>1000	-87.07
Vapour Pressure	0mm Hg	40mm Hg @-129.4°C	Decomp. Point		
Flash Point Test (°C)			Sublimation Point		
Flammability Limits (%)			pH		
Autoignition Temp (C)			Viscosity (at 20°C)		
% Volatile by volume			Evaporation Rate		
Solubility in water (g/L 25°C)	Insoluble reaction	Water at 17°C	Lower Explosion Limit		
Upper Explosion Limit					

(N Av = Not available)

(N App = Not applicable)

1.2 INGREDIENTS

CHEMICAL ENTITY	CAS NO	PROPORTION
Mg ₁ P ₁	12057-74-8	66%
PH ₁	7803-51-2	} 44%
NH ₁ COONH ₁	1111-78-0	
NH ₁	7664-41-7	
CO ₁	124-38-9	

1.3 APPEARANCE AND ODOUR

Magtoxin and magnesium phosphide are a dark charcoal grey. The odour of hydrogen phosphide (phosphine) may appear similar to garlic, carbide or decaying fish.

2 HEALTH INFORMATION

2.1 HEALTH HAZARD INFORMATION

Protective Clothing

Wear gloves when handling Magtoxin.

Respiratory Protection

An approved full-face mask with approved canister for phosphine (hydrogen phosphide PH₁) may be worn at concentrations up to 15ppm. At levels above this, or where the hydrogen phosphide concentration is unknown, approved SCBA or equivalent must be worn.

Protective Clothing

Wear gloves when handling magnesium phosphide tablets and pellets.

Eye Protection

None required

Ventilation

Local ventilation is generally adequate to reduce hydrogen phosphide levels in fumigated areas outdoors. Exhaust fans may be used to speed the aeration of silos, warehouses, shiploads, containers, and other enclosed areas where Magtoxin is used.

2.2 HEALTH EFFECTS

Magnesium phosphide is a highly toxic substance. The mammalian LD₅₀ for hydrogen phosphide gas is about 190ppm for a one-hour inhalation exposure. The acute oral toxicity for the Magtoxin formulation was found to be 9.1mg/kg of body weight.

Magnesium phosphide is not known to cause chronic poisoning, although sub-lethal poisoning may cause prolonged symptoms.

Carcinogenicity

Magnesium phosphide is not known to be carcinogenic.

Signs and Symptoms of exposure

Magnesium phosphide fumigant products react with moisture from soil or air, acids and many other liquids to release hydrogen phosphide 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 pains, diarrhoea and difficulty in breathing.

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

2.3 FIRST AID

Routes of Entry

Magnesium phosphide and hydrogen phosphide gas from these fumigants are not absorbed dermal. Primary route of exposure are inhalation and ingestion.

Emergency and first aid procedures

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

Inhalation

Get exposed person to fresh air. Keep warm and make sure person can breathe freely. If breathing has stopped, give artificial respiration by the Holger-Neilson method or via resuscitation equipment. Do not use mouth-to-mouth resuscitation. Do not give anything by mouth to an unconscious person.

Skin or clothing

Brush or shake material off clothes 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 vehicles, motel rooms, etc. Wash contaminated skin thoroughly with soap and water.

Swallowed

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

3 SAFE HANDLING INFORMATION

3.1 STORAGE AND TRANSPORT

Precautions to be taken in handling and storage

Store Magtoxin in a locked, dry, well-ventilated area, away from heat. Post as a pesticide storage area. Do not store in buildings inhabited by humans or domestic animals.

3.2 OTHER PRECAUTIONS

- 1 Always wear gloves when handling Magtoxin.
- 2 Do not allow water or other liquid to contact magnesium phosphide fumigants.
- 3 Do not pile up large quantities of magnesium phosphide products during fumigation or disposal.
- 4 Once exposed, do not confine the fumigant or allow hydrogen phosphide concentration to build up in confinement.
- 5 Open containers of Magtoxin in open air only. Do not open in a flammable atmosphere. Hydrogen phosphide in the head space of containers may flash upon exposure to atmospheric oxygen.
- 6 See the approved labelling for additional precautions and directions for use.

3.3 DISPOSAL

Disposal procedures should be reviewed with the appropriate local authority to ensure compliance with local regulations. Otherwise contact a Hazardous Waste Specialist for guidance.

- 1 Confinement of partially spent residual dust, as in a closed container, or collection and storage of large quantities of dust may result in a fire hazard. Small amounts of hydrogen phosphide may be given off from unreacted magnesium phosphide and confinement of the gas may result in a flash.
- 2 In open areas, small amounts of spent residual dust may be disposed of on site by burial or by spreading over the land surface away from inhabited buildings.
- 3 Residuals from magnesium phosphide fumigants may also be collected and disposed of in a sanitary landfill, incinerator or other approved sites or by other procedures approved by local authorities.
- 4 From 1 to 2kg of spent fumigant may be collected for disposal in an open 4 litre bucket. Caution: Do not collect dust in a large drum, dumpsters, plastic bags or other containers where confinement may occur. Transport the buckets in an open vehicle for disposal or deactivation.

3.4 DEACTIVATION OF PARTIALLY SPENT MAGTOXIN, DEGESCH PLATE AND DEGESCH STRIPS

Large volumes of Magtoxin pellets which are only partially spent may be rendered inactive by either a 'dry' or 'wet' deactivation method. The 'dry' method entails holding the pellets out of doors in locked, 30 gallon wire baskets. Protect the partially spent magnesium phosphide fumigants from rain. The deactivated products may then be taken to an approved site for incineration or burial at periodic intervals or whenever the wire container is full.

Caution:

Storage of partially spent magnesium phosphide in closed containers may result in a fire hazard.

Alternatively, partially spent Plates or Strips and dust from Magtoxin fumigations may be treated by the 'wet' deactivation method as follows:

- 1 Fill the container in which the deactivation is to be performed with water to within several centimeters of the top. Detergent is not necessary for the deactivation of spent magnesium phosphide fumigants.
- 2 The spent materials are added slowly to the water.
- 3 It is suggested that a small portion of the product be tested prior to immersing large amounts of material in water if it is suspected that the product contains considerable unreacted magnesium phosphide.
- 4 Due to the reactivity of magnesium phosphide, additions to the water should be made slowly, and carefully. Deactivation should be carried out in open air and respiratory protection may be required.
- 5 Allow the mixture to stand with occasional stirring. Do not cover the container.
- 6 Dispose of the deactivated material with or without preliminary decanting at a sanitary landfill or other suitable site approved by local authorities. Where permissible, the slurry of spent dust from pellets may be poured into a storm sewer or out onto the ground.

3.5 DISPOSAL OF SPEND MAGTOXIN TABLETS, PELLETS, DEGESCH PLATES AND DEGESCH STRIPS

If properly exposed, the greyish-white residual dust from Magtoxin will normally contain only a very small amount of unreacted magnesium phosphide and will be safe for disposal. However, the residuals from incompletely exposed magnesium phosphide fumigants may require special care.

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

3.6 UNUSUAL FIRE AND EXPLOSION HAZARDS

Do not confine particularly spent magnesium phosphide or hydrogen phosphide gas at levels above 1.8% v/v. The gas may ignite spontaneously in the air above this concentration. Open containers of magnesium phosphide fumigants in open air only and never in a flammable atmosphere. Spontaneous ignition may occur if large quantities of magnesium phosphide are pile in contact with liquid water. This is particularly true if quantities of the material are placed in moist or spoiled grain which can provide partial confinement of the hydrogen phosphide gas liberated by hydrolysis.

Fires containing hydrogen phosphide or metal phosphides will produce phosphoric acid.

3.7 EXTINGUISHING MEDIA

Suffocate Flames with sand, carbon dioxide or dry extinguishing chemicals.

Flash Point

Magnesium phosphide and Magtoxin are not themselves flammable. However, they react readily with water to produce hydrogen phosphide (phosphine PH_3 gas which may ignite spontaneously in air at concentrations above its UEL of 1.8% v/v. UEL of hydrogen phosphide is not known.

Special Fire Fighting Procedures

Do not use water on metal phosphide fires.

Respiratory Protection

Wear approved SCBA or equivalent respiratory protection.

4 SPILL OR LEAK PROCEDURES

Spill clean-up procedures

If possible, dispose of spilled Degesch Plate and Degesch Strips by use according to label instructions. Freshly spilled material which has not been contaminated by water or foreign matter may be replaced into original containers. Punctured flasks, pouches or containers may be temporarily repaired using aluminium tape.

If the age of the spill is unknown, or if the product has been contaminated with soil, debris, water, etc. gather up the spillage in small open buckets having a capacity no larger than about 1 gallon.

Do not add more than about 0.5kg to a bucket. If on-site wet deactivation is not feasible, transport the uncovered buckets in open vehicles to a suitable area.

Respiratory protection will most likely be required during clean-up of spilled magnesium phosphide fumigants. If the concentration of hydrogen phosphide is unknown, approved SCBA or its equivalent must be worn.

Small amounts of spillage, from about 2-4kg may be spread out over the ground in an open area to be deactivated by atmospheric moisture. Alternatively, spilled magnesium phosphide may be deactivated by the wet method as described in the following.

Wet deactivation:

- 1 Spilled magnesium phosphide fumigants may be deactivated with water. Do not use detergent for the deactivation of these products. Fill the container in which the deactivation is to be performed with water within a few inches of the top.
- 2 The spilled material is added slowly to the water.
- 3 Due to the reactivity of magnesium phosphide, additions of spilled product to the water should be made slowly, and carefully. Deactivation should be carried out in open air and respiratory protection may be required.
- 4 Allow the mixture to stand with occasional stirring for about 24 hours. Do not cover the container. The mixture will then be safe for disposal.
- 5 Dispose of the deactivated material with or without preliminary decanting at a sanitary landfill or other suitable site approved by local authorities. Where permissible, the slurry of spent dust from tablets or pellets may be poured into a storm sewer or out onto the ground.

5 REACTIVITY DATA

Stability

Magnesium phosphide is stable to most chemical reactions, except for hydrolysis. Magtoxin will react with moist air, liquid water, acids and some other liquids to produce toxin and flammable hydrogen phosphide gas.

Magnesium phosphide is more reactive than aluminium phosphide and will liberate hydrogen phosphide more rapidly and more completely at lower temperatures and humidities.

Incompatibility

Avoid contact with water and oxidising agents.

Hydrogen phosphide gas 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. 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 may be damaged by this gas. 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.

Hazardous Polymerisation:

Will not occur.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind, expresses or implied, and we assume no responsibility for any loss, damage or expense, direct or consequential arising out of their use.