



INTECH ORGANICS LTD

MATERIAL SAFETY DATA SHEET

Product Name: PESTPHOS

1. IDENTIFICATION OF THE SUBSTANCE & THE COMPANY

CHEMICAL NAME: ALUMINIUM PHOSPHIDE
SYNONYM(S): Aluminium(III) phosphide
MOLECULAR WEIGHT 57.95
COMPANY
Intech Organics Ltd, 543-D, pace city-II, Sector 37, Gurgaon 122001, India

Emergency telephone number: + 91-124-4407000

2. COMPOSITION / INFORMATION ON INGREDIENTS

Components CAS	CAS NO	Weight %
Aluminium phosphide	20859-73-8	56%
Other Ingredients		44%

3. HAZARDS IDENTIFICATION

General; Aluminium phosphide is very dangerous and can kill if swallowed. The product release phosphine gas slowly in moist air and immediately, if wet. It also releases ammonia, which is toxic by inhalation and can burn mucous membranes. Mild exposure causes malaise, ringing in the ears, fatigue, nausea and pressure in the chest, which is relieved by removal to fresh air. Moderate poisoning will cause weakness, vomiting, pain above the stomach, chest pain, diarrhea and difficulty breathing. In severe poisoning signs may occur within a few hours to several days resulting in pulmonary edema and may lead to dizziness, cyanosis, unconsciousness and death

EYE CONTACT Will irritate the eyes

SKIN CONTACT may cause skin burns rashes and skin itching

INHALATION Extremely toxic, headache, fatigue, nausea, dizziness, tremors, restlessness.

INGESTION Do not give anything by mouth if patient is unconscious. Seek medical attention.

Issue Number	01	MSDS ALP	Review Number	01
Issued Date	01.06.2016		Review Date	01.12.2017



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MATERIAL SAFETY DATA SHEET

Product Name: PESTPHOS

4. FIRST-AID MEASURES

- General** Aluminium phosphide is very dangerous and can kill if swallowed. The product release phosphine gas slowly in moist air and immediately, if wet. It also releases ammonia, which is toxic by inhalation and can burn mucous membranes. Mild exposure causes malaise, ringing in the ears, fatigue, nausea and pressure in the chest, which is relieved by removal to fresh air. Moderate poisoning will cause weakness, vomiting, pain above the stomach, chest pain, diarrhea and difficulty breathing. In severe poisoning signs may occur within a few hours to several days resulting in pulmonary edema and may lead to dizziness, cyanosis, unconsciousness and death
- Inhalation** Do not inhale dust or gas from product. If inhaled remove patient to fresh air. Keep rested and warm and seek medical assistance. If patient is not breathing resuscitate using oxy-viva or one-way mask. Do not give mouth-to-mouth resuscitation
- Skin contact** Brush or shake material off clothes in a well ventilated area. Allow cloths to aerate in a ventilated area prior to laundering. Do not leave contaminated clothing in occupied and or confined areas such as cars. If material is on skin, wash off the skin with soap and water.
- Eye contact** Will irritate the eyes. If material is in the eye, hold open and flush with water for at least 15 minutes.
- Ingestion** If swallowed seek medical attention. Give one or two glasses of water and induce vomiting, preferably using Ipecac Syrup APF. Do not give anything by mouth if patient is unconscious. Seek medical attention.

Advice to doctor: - If a patient has swallowed Aluminium phosphide ,he/she may be emitting toxic phosphine gas. First aid and medical staff should take precautions against exposure to phosphine emitted by such a patient. Do not administer mouth-to-mouth resuscitation - use other forms of resuscitation.

5. FIRE - FIGHTING MEASURES

Extinguishing Media Suffocate flames with sand, carbon dioxide or dry extinguishing powder. Do NOT use water on metal phosphide fires.

Fire and Explosion Hazards. Flammable. Keep away from naked flames. Avoid contact with water and strong oxidizing agents' Hazardous polymerization will not occur

FIRE FIGHTING PROCEDURE

Special firefighting procedures: Wear full protective clothing and self-contained breathing apparatus. Contain firefighting water.

Issue Number	01	MSDS ALP	Review Number	01
Issued Date	01.06.2016		Review Date	01.12.2017



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MATERIAL SAFETY DATA SHEET

Product Name: PESTPHOS

Hazardous Combustion Products Fires involving phosphine or metal phosphides will produce phosphoric acid.
 $2PH_3 + 4O_2 \rightarrow 3H_2O + P_2O_5 \rightarrow 2H_3PO_4$

6. ACCIDENTAL RELEASE MEASURES

Accidental Release: Use the personal protective equipment listed in Section 8. If possible, dispose of spilled Aluminium Phosphide by use according to the label. Freshly spilled material which has not been contaminated with water or foreign matter may be replaced into original containers. Punctured containers may be temporarily repaired using aluminium tape. If the age of the spill is unknown, or the material has been contaminated with soil, debris, water etc., gather up the spillage into small open buckets having a capacity no larger than 4.5 litres. Do not add more than about 1 to 1.5 kg to a bucket. If on-site wet deactivation is not feasible, transport the uncovered buckets in open vehicles to a suitable area. Wear gloves when handling Aluminium Phosphide. Respiratory protection is required during clean-up of spilled material. If the concentration of hydrogen phosphide is above 15ppm, or is unknown, approved positive pressure, supplied air breathing apparatus must be worn. Small amounts of spillage, from about 4 - 8 kg may be spread out over the ground in an open area to be deactivated by atmospheric moisture. Alternatively the material may be wet deactivated as described in Section 13

7. HANDLING AND STORAGE

Safe Handling : Keep container tightly closed. Handle according to label instructions.

STORAGE Store in the closed, original container in a cool, dry, well-ventilated locked area out of the reach of children and unauthorized persons and away from all dwellings. Keep away from water and liquids. Water and many liquids cause immediate release of phosphine from product. The product should never be stored under conditions which would allow the gas concentrations to reach the lower level of flammability which is 1.79% by volume (12,900 parts per million). Never confine the product in a small gas-proof enclosure such as a plastic bag. Such confinement could cause the gas concentrations to reach the lower flammability level. Protect, by sealing or otherwise, sensitive electrical and electronic equipment (meters, switches, fire alarm systems, etc. containing copper/copper alloy components, photographic film or copy paper. Phosphine corrodes copper-based materials. Store below 30o C. This material is a Schedule 7 Dangerous Poison and must be stored, handled and used in accordance with the relevant regulations.

Issue Number	01	MSDS ALP	Review Number	01
Issued Date	01.06.2016		Review Date	01.12.2017



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MATERIAL SAFETY DATA SHEET

Product Name: PESTPHOS

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS:

COMPONENT	OSHA PEL	ACGIH TLV		IDHL
	(ppm)	TWA (ppm)	STEL (ppm)	(ppm)
Hydrogen phosphide	0.3	0.3	1.0	200
Ammonia	50	25	35	500
Carbon dioxide	5000	5000	30000	50000

VENTILATION REQUIREMENTS

Open product container in the open air. Local ventilation is generally adequate to reduce hydrogen phosphide levels in fumigated premises to below the TLV/TWA. Exhaust fans may be used to speed the aeration of silos, warehouses, ships hold, containers, etc.

PERSONAL PROTECTIVE EQUIPMENT:

- RESPIRATORY PROTECTION

A full-face respirator with an ABEK canister must be worn at concentrations up to 15 ppm or when dispensing tablets by hand. At levels above this, and/or when hydrogen phosphide concentration is unknown, a positive pressure, supplied air respirator must be worn. In all cases ensure that the respirator provides good facial fit.

- EYE PROTECTION

Eye Protection None required.

- SKIN AND BODY PROTECTION

Do not allow product to come in contact with skin. When opening the container or using the product, wear elbow length PVC gloves. If product on skin, brush off any excess material and wash area with soap and water. Wash hands before breaks and at end of work.

HYGIENE MEASURES

Issue Number	01	MSDS ALP	Review Number	01
Issued Date	01.06.2016		Review Date	01.12.2017



INTECH ORGANICS LTD

MATERIAL SAFETY DATA SHEET

Product Name: PESTPHOS

General Advice When using this material, do not eat, drink or smoke. Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking
Avoid contact with eyes or skin. Clean working clothes and protective equipment with soap and water. When space fumigating in enclosed areas (eg rooms, warehouses) wear protective clothing and respiratory protection as specified above. Wash hands after use.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE The active material is contained in tablets
Colour Aluminium phosphide has a greenish-grey colour.
Odour The phosphine gas generated by the product has an odour described as similar to garlic, carbide, or decaying fish.
Melting Point Aluminium phosphide: >1000o C Phosphine gas: -133o C
Boiling Point Aluminium phosphide: >1000o C Phosphine gas: -87.7o C
Specific Gravity Aluminium phosphide: 2.55
Phosphine: 1.17 (relative to air =1)
Vapour Pressure Aluminium phosphide: 0 mmHg
Phosphine gas: 40 mmHg @ -129.4o C
Ammonium Carbonate: 100 mmHg @ 26.7o C
Viscosity Not applicable
Solubility in Water Aluminium phosphide: Insoluble,
reacts Phosphine gas: 26 cc in 100 mL water at 17o C
Ammonium Carbonate: Very soluble, reacts
pH 6.0-7.5 (at 10% water)
Flash Point Aluminium phosphide and the formulated product (Aluminium Phosphide) are not in themselves flammable. Ammonia and carbon dioxide are liberated at the same time as phosphine to reduce the potential for self-ignition
Ignition Temperature Not available
Explosive Limits The product in itself is not explosive, however see above regarding phosphine gas. Phosphine LEL 1.8% w/v, UEL not known.

10. STABILITY AND REACTIVITY

Chemical Stability Aluminium Phosphide is stable to most chemical reactions, except for hydrolysis. It will react with moist air, liquid water, acids and some other

Issue Number	01	MSDS ALP	Review Number	01
Issued Date	01.06.2016		Review Date	01.12.2017



INTECH ORGANICS LTD

MATERIAL SAFETY DATA SHEET

Product Name: PESTPHOS

Conditions to Avoid	liquids to produce toxic and flammable phosphine gas. Avoid contact with water and oxidizing agents. Keep away from naked flame – forms toxic gas. Keep away from damp and moisture. Contact with water can cause the immediate release of phosphine gas. Avoid hydrogen phosphide-air mixtures at concentrations above the lower explosive limit of 1.8% v/v as these may ignite spontaneously. Never allow the buildup of hydrogen phosphide to exceed explosive concentrations.
Incompatible Materials	Water, acids.
Hazardous Decomposition	Fires involving phosphine or metal phosphides will produce phosphoric acid. $2PH_3 + 4O_2 \rightarrow 3H_2O + P_2O_5 \rightarrow 2H_3PO_4$
Hazardous Reactions	The prime hazardous reaction is the reaction with water or moisture to produce toxic phosphine gas (hydrogen phosphide). Hydrogen phosphide gas may react with certain metals and cause corrosion, especially at higher temperatures and relative humidity. 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, forklifts, temperature monitoring systems, switching gears, communication devices, computers, calculators and other electrical equipment may be damaged by this gas. Phosphine will also react with certain metallic salts and therefore sensitive items such as photographic film, some inorganic pigments, etc., should not be exposed.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity	Aluminium phosphide is a highly acutely toxic substance. Acute oral LD50 of the formulation is 11.5 mg/kg. Hydrogen phosphide (phosphine) gas LC50 is about 190 ppm for a 1-hour inhalation exposure.
Local Effects	Aluminium phosphide and phosphine gases are not absorbed dermally. Primary routes of exposure are inhalation and ingestion.
Reproductive Effects	None of the ingredients of the formulation has been shown to produce reproductive or teratogenic effects.
Mutagenicity	None of the ingredients of the formulation has been shown to produce mutagenic effects.
Carcinogenic	Effects None of the ingredients in the formulation has been shown to have carcinogenic potential.
Health Hazard Information	Aluminium phosphide is a highly acutely toxic substance in its own right. In contact with moisture in the air (or more rapidly in contact with water) it

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Issued Date	01.06.2016		Review Date	01.12.2017



INTECH ORGANICS LTD

MATERIAL SAFETY DATA SHEET

Product Name: PESTPHOS

releases hydrogen phosphide gas, ammonia and carbon dioxide. Aluminium phosphide is very toxic by ingestion causing the release of hydrogen phosphide in the body. Hydrogen phosphide released from Aluminium phosphide is very toxic by inhalation. Care must be taken during first aid and treatment that hydrogen phosphide released from the poisoned individual does not injure medical personnel

12. ECOLOGICAL INFORMATION

Octanol/Water Partition Co-efficient : Not available.

Eco toxicity Not available. This product is highly toxic to wildlife. Do not contaminate streams, rivers or waterways with the chemical or used containers.

13. DISPOSAL CONSIDERATIONS

After Intended Use After fumigation with product, remove spent tablets and ensure residual phosphide is destroyed before disposal, eg. by swamping with dilute acid or soapy water in open air until bubbling ceases. Triple rinse the containers with soapy water to ensure residual phosphide is destroyed. Destroy empty containers by breaking, crushing or puncturing them. Dispose of the containers at a local authority landfill, bury the containers at a depth of 500 mm or more at a licensed landfill. Do not burn empty containers or the product.

After spill or accident: If possible, dispose of spilled Aluminium Phosphide by using according to the label. Freshly spilled material, which has not been contaminated with water or foreign matter, may be replaced into original containers. Punctured containers may be temporarily repaired using Aluminium tape. If the age of the spill is unknown, or the material has been contaminated with soil, debris, water etc., gather up the spillage into small open buckets having a capacity no larger than 4.5 liters. Do not add more than about 1 to 1.5 kg to a bucket. If on-site wet deactivation is not feasible, transport the uncovered buckets in open vehicles to a suitable area. Wear gloves when handling Aluminium Phosphide. Respiratory protection as specified in Section 8 is required during clean-up of spilled material. If the concentration of hydrogen phosphide is unknown, positive pressure, supplied air breathing apparatus must be worn. Small amounts of spillage, from about 4 - 8 kg may be spread out over the ground in an open area to be deactivated by atmospheric moisture. Alternatively, the material may be wet deactivated as described below. Wet deactivation: Deactivating solution is prepared by adding a low sudsing detergent to water in a drum or other suitable container. A 2% solution or 4 cups of detergent to 130 liters is suggested. The container should be filled with deactivating solution to

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MATERIAL SAFETY DATA SHEET

Product Name: PESTPHOS

within a few centimeters of the top. The Aluminium Phosphide is added slowly to the deactivating solution and stirred so as to thoroughly wet all the Aluminium Phosphide. This should be carried out in the open air and respiratory protection may be required. No more than 20-25 kg of Aluminium Phosphide, Tablet/Pelets should be added to 70 liters of solution Allow the mixture to stand, with occasional stirring, for about 36 hours. The resultant slurry will then be safe for disposal. Dispose of the slurry or deactivated material, with or without preliminary decanting, at a landfill or other suitable site approved by local authorities.

14. TRANSPORTATION INFORMATION

UN No. 3048

IMO Proper shipping name: ALUMINIUM PHOSPHIDE PESTICIDE

Class: Class 6.1

Packaging Group: I

Hazchem Code: 4WE

15. REGULATORY INFORMATION

Poisons Schedule: Schedule 7 – Dangerous Poison

APVMA Registration The product is registered by the APVMA.

Registration Number 46948

Labelling All necessary directions, precautions and warnings for normal use of the product are included on the product label.

16. OTHER INFORMATION

Health, Safety & Environment Policy

We endeavor to ensure that our operations and products meet the needs of the present global community without compromising in quality of product. We accept that the success of our business is dependent on the supply of products and services that will benefit society whilst ensuring human safety and protection of the environment and natural resources, We ensure healthy and safe work environment for employees and whilst maintaining high production standards of operation

NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE, ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH THE INFORMATION REFERS.

END OF SAFETY DATA SHEET

Issue Number	01	MSDS ALP	Review Number	01
Issued Date	01.06.2016		Review Date	01.12.2017