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**PRODUCT NAME:** ALUMINIUM PHOSPHIDE

## 1. IDENTIFICATION OF THE SUBSTANCE & THE COMPANY

CHEMICAL NAME : ALUMINIUM PHOSPHIDE.  
SYNONYM(S) : Aluminium (III) phosphide.  
TRADE NAME : PEST PHOS  
MOLECULAR WEIGHT : **57.95**  
PRODUCER : **INTECH ORGANICS LTD, Plot No - 27, Sector - 34 | Gurgaon | Haryana - 122004, India.** Telephone number: + 91-124-4407000  
EMERGENCY NUMBER: : 1-703-527-3887, 1-800-424-9300 ,1-703-741-5970 ,0008001007141  
OFFICIAL USE OF THE PRODUCT: PESTICIDES.

## 2. HAZARDS IDENTIFICATION

### STATEMENT OF HAZARDOUS NATURE

This product is classified as: Toxic. Hazardous, Dangerous according to ADG Code, IATA and IMDG/IMSBC .

**SUSMP CLASSIFICATION:** S7

**ADG CLASSIFICATION:** Class 4.3: Substances which in Contact with Water Emit Flammable Gases. Sub Risk: Class 6.1, Toxic Substances.

**UN NUMBER:** 1397 ALUMINIUM PHOSPHIDE



Hazard classification & labelling

*Danger!*

According to the **harmonized classification and labelling** approved by the European Union, this substance is fatal if swallowed, is fatal if inhaled, is toxic in contact with skin, is very toxic to aquatic life and in contact with water releases flammable gases which may ignite spontaneously.

### GHS SIGNAL WORD: DANGER.

Substances and mixtures which, in contact with water, emit flammable gases Category 1  
Acute Toxicity Oral Category 1 or 2  
Acute Toxicity Inhalation Category 3  
Hazardous to aquatic environment short term/Acute Category 2

### HAZARD STATEMENT:

H260: In contact with water releases flammable gases which may ignite spontaneously  
H261: In contact with water releases flammable gases  
H300: Fatal if swallowed.  
H331: Toxic if inhaled.  
H401: Toxic to aquatic life.

Issue Number	01	MSDS ALP	Review number	03
Issue Date	28.09.2021		Review Date	11.11.2024

-----  
**PRODUCT NAME: ALUMINIUM PHOSPHIDE**  
-----

#### **PREVENTION**

- P102: Keep out of reach of children.
- P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.
- P232: Protect from Moisture
- P260: Do not breathe dusts.
- P262: Do not get in eyes, on skin, or on clothing.
- P264: Wash contacted areas thoroughly after handling.
- P270: Do not eat, drink or smoke when using this product.
- P271: Use only outdoors or in a well ventilated area.
- P273: Avoid release to the environment.
- P280: Wear protective gloves, protective clothing and eye or face protection.

#### **RESPONSE**

- P311: Call a POISON CENTER or doctor.
- P337: If eye irritation persists: seek medical attention.
- P353: Rinse skin or shower with water.
- P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P335+ P334: Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.
- P370+P378: In case of fire, note the following. Dry Agent. Water MUST NOT be allowed to come into contact with the product since a dangerous reaction is likely to take place. Try to contain spills, minimise spillage entering drains or water courses.

#### **STORAGE**

- P405: Store locked up.
- P402+P404: Store in a dry place. Store in a closed container. P403+P235: Store in a well-ventilated place. Keep cool.

#### **DISPOSAL**

- P501: Dispose of contents and containers as specified on the registered label

### **3. COMPOSITION / INFORMATION ON INGREDIENTS**

<b>Components CAS</b>	<b>CAS NO</b>	<b>Weight %</b>
Aluminium phosphide.	20859-73-8	56%
Other Ingredients(Inerts)	-	44%

Issue Number	01	MSDS ALP	Review number	03
Issue Date	28.09.2021		Review Date	11.11.2024

-----  
**PRODUCT NAME: ALUMINIUM PHOSPHIDE**  
-----

#### 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 area 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, 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:**

Control flames with sand, carbon dioxide or dry extinguishing powder. Do not use water on metal phosphide fires.

- **FIRE AND EXPLOSION HAZARDS:**

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

Issue Number	01	MSDS ALP	Review number	03
Issue Date	28.09.2021		Review Date	11.11.2024

-----  
**PRODUCT NAME: ALUMINIUM PHOSPHIDE**  
-----

- **FIRE FIGHTING PROCEDURE :**

- **SPECIAL FIREFIGHTING PROCEDURES:**

Wear full protective clothing and self- contained breathing apparatus.

- **HAZARDOUS COMBUSTION PRODUCTS:**

Fires involving phosphine or metal phosphides will produce phosphoric acid.



## 6. ACCIDENTAL RELEASE MEASURES

### ACCIDENTAL RELEASE:

- Use the personal protective equipment listed in Section 8.
- 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 aluminum 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

Issue Number	01	MSDS ALP	Review number	03
Issue Date	28.09.2021		Review Date	11.11.2024

**PRODUCT NAME: ALUMINIUM PHOSPHIDE**

from product.

- iii. 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).
- iv. 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.
- v. 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.
- vi. Store below 30°C.
- vii. This material is a Schedule 7 Dangerous Poison and must be stored, handled, and used in accordance with the relevant regulations.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**a) 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.

**b) 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 like safety Goggles & safety glassess are recommended

Issue Number	01	MSDS ALP	Review number	03
Issue Date	28.09.2021		Review Date	11.11.2024

-----  
**PRODUCT NAME: ALUMINIUM PHOSPHIDE**  
-----

• **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.

**c) HYGIENE MEASURES**

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.

**d) GENERAL ADVICE:**

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

<b>APPEARANCE</b>	The active material is contained in tablets
<b>COLOUR</b>	Aluminium phosphide has a greenish-grey colour.
<b>ODOUR</b>	The phosphine gas generated by the product has an odour described as similar to garlic, carbide, or decaying fish.
<b>MELTING POINT</b>	Aluminium phosphide: >1000 <sup>0</sup> C Phosphine gas: -133 <sup>0</sup> C
<b>BOILING POINT</b>	Aluminium phosphide: >1000 <sup>0</sup> C Phosphine gas: -87.7 <sup>0</sup> C
<b>SPECIFIC GRAVITY</b>	Aluminium phosphide: 2.55, Phosphine: 1.17 (relative to air =1)
<b>VAPOUR PRESSURE</b>	Aluminium phosphide: 0 mHg Phosphine gas:40 mmHg @ 29.4 <sup>0</sup> C Ammonium Carbonate: 100 mmHg @ 26.7 <sup>0</sup> C
<b>VISCOSITY</b>	Not applicable
<b>SOLUBILITY IN WATER:</b>	Aluminium phosphide: Insoluble, reacts Phosphine gas:26 cc in 100 ml water at 17 <sup>0</sup> C Ammonium Carbonate: Very soluble, reacts

Issue Number	01	MSDS ALP	Review number	03
Issue Date	28.09.2021		Review Date	11.11.2024

# INTECH ORGANICS LTD

## MATERIAL SAFETY DATA SHEET

-----  
**PRODUCT NAME: ALUMINIUM PHOSPHIDE**

**PH** 6.0-7.5 (at 10% water)

**FLASH POINT** Aluminium phosphide and the formulated product (Aluminium Phosphide) are solid 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 liquids to produce toxic and flammable phosphine gas. Avoid contact with water and oxidizing agents

**CONDITIONS TO AVOID** 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.



**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

Issue Number	01	MSDS ALP	Review number	03
Issue Date	28.09.2021		Review Date	11.11.2024

**PRODUCT NAME: ALUMINIUM PHOSPHIDE**

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 LD<sup>50</sup> of the formulation is 11.5 mg/kg. Hydrogen phosphide (phosphine) gas LC<sub>50</sub> is about 190 ppm for a 1-hour inhalation exposure.

**LOCAL EFFECTS** Aluminium phosphide and phosphine gases are not absorbed dermally. Primary routes or 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** 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 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** 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

Issue Number	01	MSDS ALP	Review number	03
Issue Date	28.09.2021		Review Date	11.11.2024

# INTECH ORGANICS LTD

## MATERIAL SAFETY DATA SHEET

-----  
**PRODUCT NAME: ALUMINIUM PHOSPHIDE**

---

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:.** 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 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.

Issue Number	01	MSDS ALP	Review number	03
Issue Date	28.09.2021		Review Date	11.11.2024



# INTECH ORGANICS LTD

## MATERIAL SAFETY DATA SHEET

**PRODUCT NAME:** ALUMINIUM PHOSPHIDE

### 14. TRANSPORTATION INFORMATION

UN NO. 1397 IMO PROPER SHIPPING NAME: ALUMINIUM PHOSPHIDE PESTICIDE Class 4.3: Substances which in Contact with Water Emit Flammable Gases 6.1, Toxic Substances. PACKAGING GROUP: I HAZCHEM CODE: 4WE	<table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: left;">IATA</td> </tr> <tr> <td style="width: 60%;">UN number</td> <td>UN1397</td> </tr> <tr> <td>Proper Shipping Name</td> <td>Aluminum Phosphide</td> </tr> <tr> <td>Transport hazard class(es)</td> <td>4.3</td> </tr> <tr> <td>Subsidiary hazard class</td> <td>6.1</td> </tr> <tr> <td>Packing Group</td> <td>I</td> </tr> <tr> <td>Marine Pollutant</td> <td>Yes</td> </tr> </table>	IATA		UN number	UN1397	Proper Shipping Name	Aluminum Phosphide	Transport hazard class(es)	4.3	Subsidiary hazard class	6.1	Packing Group	I	Marine Pollutant	Yes
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Packing Group	I														
Marine Pollutant	Yes														

### 15. REGULATORY INFORMATION

**POISONS SCHEDULE:** Schedule 7 – Dangerous Poison

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

**RISK PHRASES:**

- 15/29 - Contact with water liberates toxic, extremely flammable gas.
- 26/28 - Very toxic by inhalation and if swallowed.
- 50 - Very toxic to aquatic organisms.

**SAFETY PHRASES:**

- 1/2 - Keep locked up and out of the reach of children.
- 3/9/49 - Keep only in the original container in a cool well-ventilated place.
- 22 - Do not breathe dust.
- 30 - Never add water to this product.
- 43 - In case of fire, use dry sand, powder or CO2. Never use water.

### 16. OTHER INFORMATION

#### HEALTH, SAFETY & ENVIRONMENT POLICY

Intech Organics Ltd. is committed to safeguarding the Health & safety of all and protect the environment through , Institutionalizing of HSE Management process with HES organization Regularly communicating, educating and imparting training on safety, health, hygiene, and environment to all employees. contractors, contractor’s staff, consultants, and visitors. Specifying and ensuring high standers of Safety and Environment during construction and operation at our plant. Evaluating the HSE performance of our employees & Contractors against the HSE requirements. Foster continuous improvements benchmark our HSE performance through adopting best practices with commitments to compliance of all applicable legal & other requirement Committed to conserve our natural resources and minimize potentially harmful effects resulting from our operation & implement improvements associated with the prevention of pollution, injury, and illness. Making the HSE policy widely known to all employees, contractors & interested parties, also periodically reviewing the same for improvements

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	03
Issue Date	28.09.2021		Review Date	11.11.2024