

SECTION 1: Identification of the Substance and of the Company/Undertaking

1.1 Product Identifier

Product Name	Aluminium Phosphide
Chemical Name	Aluminium Phosphide
Synonyms	Aluminium (III) phosphide
Molecular Formula	AlP
Molecular Weight	57.95 g/mol
CAS Number	20859-73-8
UN Number	1397 (Aluminium Phosphide)
Physical Form	Tablet
Purity / Assay	Aluminium Phosphide 15%, 35%, 56% and 57%

1.2 Relevant Identified Uses of the Substance and Uses Advised Against

Relevant Identified Uses	Fumigant pesticide.
Uses Advised Against	Any use not specifically identified in the product label; consumer/household use outside label directions.

1.3 Details of the Supplier of the Safety Data Sheet

Company Name	Intech Organics Ltd
Registered Office	Plot No. 27, Sector - 34 Gurgaon, Haryana - 122004 India
Telephone	+91-124-4407000

1.4 Emergency Telephone Number

Medical Emergency / CHEMTREC (International)	+1-703-527-3887
CHEMTREC (USA & Canada)	+1-800-424-9300
CHEMTREC (Outside USA & Canada)	+1-703-741-5970

SECTION 2: Hazards Identification

2.1 Classification of the Substance or Mixture

Hazard Classification	Substances and mixtures which, in contact with water, emit flammable gases – Category 1 Acute Toxicity – Oral, Category 2 Acute Toxicity – Dermal, Category 3 Acute Toxicity – Inhalation, Category 1 Hazardous to the Aquatic Environment – Acute, Category 1
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2.2 Label Elements

Signal Word

Danger



Hazard Pictograms

GHS02

GHS06

GHS09

Hazard Statements

H260 In contact with water releases flammable gases which may ignite spontaneously.
H300 Fatal if swallowed.
H311 Toxic in contact with skin.
H330 Fatal if inhaled.
H400 Very toxic to aquatic life.

2.3 Other Hazards

Other Hazards

Aluminium phosphide reacts with moisture or water to generate toxic and flammable phosphine gas. Contact with acids may also result in the generation of phosphine gas. Phosphine may accumulate in poorly ventilated or enclosed areas and presents a serious inhalation hazard.

SECTION 3: Composition/Information on Ingredients

3.1 Mixtures

Product Grade	Components	CAS No.	Weight %
Aluminium Phosphide 15%	Aluminium Phosphide	20859-73-8	15% (Min.)
	Other Ingredients (Inerts)	–	85%
Aluminium Phosphide 35%	Aluminium Phosphide	20859-73-8	35% (Min.)
	Other Ingredients (Inerts)	–	65%
Aluminium Phosphide 56%	Aluminium Phosphide	20859-73-8	56% (Min.)
	Other Ingredients (Inerts)	–	44%
Aluminium Phosphide 57%	Aluminium Phosphide	20859-73-8	57% (Min.)
	Other Ingredients (Inerts)	–	43%

For the full text of the H-statements mentioned in this Section, see Section 16.

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

General	Aluminium phosphide is highly toxic and may be fatal if swallowed. The product releases phosphine gas slowly in moist air and rapidly when exposed to water or moisture. Exposure may cause malaise, ringing in the ears, fatigue, nausea, chest pressure, vomiting, abdominal pain, chest pain, diarrhoea and difficulty breathing. Severe poisoning may result in pulmonary oedema, dizziness, cyanosis, unconsciousness and death. Seek immediate medical attention following suspected exposure.
Inhalation	Do not inhale dust or gas from the product. If inhaled, remove the affected person to fresh air. Keep the person rested and warm and seek immediate medical attention. If breathing has stopped, provide artificial respiration using appropriate resuscitation equipment or a one-way mask. Do not give mouth-to-mouth resuscitation because the patient may release toxic phosphine gas.
Skin Contact	Brush or shake off any loose material from clothing in a well-ventilated area. Allow contaminated clothing to aerate in a well-ventilated area before laundering. Do not leave contaminated clothing in occupied or confined areas. If the product comes into contact with the skin, wash thoroughly with soap and water. Seek medical attention if irritation or other symptoms occur.
Eye Contact	Immediately flush the affected eye(s) with clean, gently flowing water for at least 15–20 minutes while keeping the eyelids open. Remove contact lenses, if present and easy to do, after several minutes of flushing. Continue flushing and seek medical attention.
Ingestion	If swallowed, rinse the mouth thoroughly with water and seek immediate medical attention. Do not give anything by mouth to an unconscious person. The patient may release toxic phosphine gas; appropriate precautions should be taken by persons providing first aid and medical treatment.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

Symptoms and Effects	Exposure may cause nausea, vomiting, abdominal pain, chest pain, headache, fatigue, dizziness and difficulty breathing. Severe poisoning may result in pulmonary oedema, cyanosis, unconsciousness and death. Symptoms of pulmonary oedema may be delayed following inhalation exposure.
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4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician	If aluminium phosphide has been swallowed, the patient may emit toxic phosphine gas. First-aid personnel and medical staff should take precautions against exposure to phosphine released by the patient. Do not administer mouth-to-mouth resuscitation; use appropriate alternative resuscitation methods. Treatment should be symptomatic and supportive.
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SECTION 5: Firefighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media	Suffocate flames with dry sand, carbon dioxide (CO ₂), or dry chemical extinguishing powder.
Unsuitable Extinguishing Media	Do not use water or water-based extinguishing media. Contact with water or moisture can rapidly generate phosphine gas and may result in a dangerous reaction.

5.2 Special Hazards Arising from the Substance or Mixture

Fire and Explosion Hazards	Aluminium phosphide itself is not flammable. However, contact with water or moisture releases phosphine (hydrogen phosphide), which is highly toxic and flammable. Phosphine may form an explosive mixture with air and may ignite spontaneously at sufficiently high concentrations. Keep the product away from water, moisture, naked flames, sparks, heat and sources of ignition.
Hazardous Combustion Products	Fires involving phosphine or aluminium phosphide may produce highly toxic fumes and phosphorus-containing combustion products, including phosphoric acid/phosphorus oxides.

5.3 Advice for Firefighters

Special Protective Equipment for Firefighters	Wear full protective clothing and self-contained breathing apparatus (SCBA). Approach the fire from upwind and avoid inhalation of smoke, vapours or decomposition products. Isolate the affected area and keep unnecessary personnel away.
Special Firefighting Procedures	Do not allow water to come into contact with the product. Fight the fire from a safe distance and prevent contaminated firefighting materials from entering drains or water courses.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

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 aluminium tape.
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6.2 Methods and material for containment and cleaning up

Cleanup of unknown/contaminated spills	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.
Respiratory precautions	If the concentration of hydrogen phosphide is above 15 ppm, or is unknown, approved positive pressure, supplied air breathing apparatus must be worn.
Small spills	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.
Alternative method	Alternatively, the material may be wet deactivated as described in Section 13.

SECTION 7: Handling and Storage

7.1 Precautions for Safe Handling

Safe Handling	Keep containers tightly closed. Handle according to the product label and recommended instructions. Handle only in well-ventilated areas. Avoid contact with moisture, water and other liquids. Avoid breathing dust or phosphine gas that may be released from the product.
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7.2 Conditions for Safe Storage, Including Any Incompatibilities

Storage Conditions	Store in the closed, original container in a cool, dry, well-ventilated and locked area, away from children and unauthorized persons and away from areas occupied by humans or animals.
	Keep away from water and liquids. Contact with water or moisture can cause rapid release of phosphine gas from the product.
	Avoid storage conditions that could allow phosphine gas concentrations to reach the lower flammability limit of approximately 1.8% by volume.
	Do not confine the product or spent material in small gas-tight enclosures, as phosphine released from the product may accumulate and form a flammable or explosive atmosphere.
	Protect sensitive electrical and electronic equipment containing copper, brass or other copper-alloy components from exposure to phosphine, which may cause corrosion.
	Store below 30°C and protect from heat, dampness and moisture.
Incompatibilities	Water, acids, oxidizing agents and moisture.

7.3 Specific End Use(s)

Specific End Use(s)	Fumigant pesticide, as identified in Section 1.2.
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SECTION 8: Exposure Controls / Personal Protection

8.1 Control Parameters

Component	OSHA PEL	NIOSH REL	ACGIH TLV	NIOSH IDLH
Hydrogen phosphide (Phosphine)	0.3 ppm TWA	0.3 ppm TWA; 1 ppm STEL	0.05 ppm TWA; 0.15 ppm STEL	50 ppm
Ammonia	50 ppm TWA	25 ppm TWA; 35 ppm STEL	25 ppm TWA; 35 ppm STEL	300 ppm
Carbon dioxide	5000 ppm TWA	5000 ppm TWA; 30000 ppm STEL	5000 ppm TWA; 30000 ppm STEL	40000 ppm

8.2 Exposure Controls

Engineering Controls / Ventilation	Open product containers only in the open air or in a well-ventilated area. Provide adequate ventilation to maintain hydrogen phosphide concentrations below the applicable occupational exposure limits. Local exhaust ventilation may be used to control phosphine levels and to assist in the aeration of fumigated areas, containers, warehouses and other enclosed spaces.
Respiratory Protection	A full-face respirator fitted with an appropriate ABEK canister may be used at hydrogen phosphide concentrations up to 15 ppm and during manual dispensing of tablets, provided the respirator is suitable for the exposure. At concentrations above 15 ppm, or when the hydrogen phosphide concentration is unknown, use a positive-pressure supplied-air respirator or self-contained breathing apparatus. Ensure that the respirator provides an appropriate facial fit.
Eye Protection	Wear safety goggles, safety glasses or suitable eye/face protection. A face shield may be used where there is a risk of exposure to dust or product particles.
Skin and Body Protection	Avoid contact of the product with skin. When opening containers or handling the product manually, wear suitable protective gloves and protective clothing. The attached Intech SDS specifies elbow-length PVC gloves for handling. If product comes into contact with the skin, brush off loose material and wash the affected area thoroughly with soap and water.
Hygiene Measures	Do not eat, drink or smoke when using or handling the product. Wash hands thoroughly before eating, drinking or smoking and after handling the product.
General Advice	Avoid inhalation of dust and phosphine gas and avoid contact with eyes and skin. Keep working clothes and protective equipment clean. When handling the product in enclosed areas or during fumigation, use appropriate ventilation and respiratory protection as specified above.

SECTION 9: Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Appearance	Tablet greenish-grey to grey solid	Odour	The phosphine gas generated by the product has an odour described as similar to garlic, carbide, or decaying fish.
pH	6.0–7.5 (at 10% water)	Melting Point	Aluminium phosphide: > 1000 °C
Boiling Point	Aluminium phosphide: > 1000 °C	Flash Point	Aluminium phosphide and the formulated product are solids and are not flammable in themselves. Ammonia and carbon dioxide are liberated along with phosphine and reduce the potential for self-ignition.

Ignition Temperature	Not available	Explosive Limits	The product itself is not explosive. Phosphine gas LEL: 1.8% v/v; UEL: not known.
Vapour Pressure	Aluminium phosphide: 0 mmHg	Specific Gravity	Aluminium phosphide: 2.55; phosphine: 1.17 (relative to air = 1)
Water Solubility	Aluminium phosphide: Insoluble; reacts with water	Viscosity	Not applicable
Molecular Formula	AlP	Molecular Weight	57.95 g/mol

9.2 Properties of Related Decomposition Product – Phosphine Gas

Melting Point	–133 °C	Boiling Point	–87.7 °C
Vapour Pressure	40 mmHg at 29.4 °C	Water Solubility	26 cc/100 mL water at 17 °C

SECTION 10: Stability and Reactivity

10.1 Reactivity

Hazardous Reactions	The primary hazardous reaction is hydrolysis with water or moisture, resulting in the generation of toxic and flammable phosphine (hydrogen phosphide) gas. Phosphine may react with certain metals and cause corrosion, particularly at elevated temperature and relative humidity. Copper, brass and other copper-containing alloys are susceptible to corrosion by phosphine. Certain electrical and electronic equipment containing copper or copper alloys may therefore be damaged by exposure to phosphine. Phosphine may also react with certain metallic salts.
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10.2 Chemical Stability

Chemical Stability	Aluminium phosphide is stable under dry conditions but reacts with moisture. It undergoes hydrolysis in moist air, water and acids, producing toxic and flammable phosphine gas.
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10.3 Conditions to Avoid

Conditions to Avoid	Avoid contact with water, moisture, damp air, acids, heat, naked flames and other sources of ignition. Prevent the accumulation of phosphine gas. Phosphine–air mixtures at or above the lower explosive limit of approximately 1.8% v/v may ignite spontaneously. Keep the product dry and prevent conditions that may allow hazardous concentrations of phosphine to accumulate.
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10.4 Incompatible Materials

Incompatible Materials	Water, moisture, acids and oxidizing agents.
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10.5 Hazardous Decomposition Products

Hazardous Decomposition Products	Reaction with moisture, water or acids produces phosphine (hydrogen phosphide), a toxic and flammable gas. During combustion of phosphine or aluminium phosphide, phosphorus-containing combustion products, including phosphoric acid, may be formed.
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SECTION 11: Toxicological Information

11.1 Acute Toxicity

Acute Toxicity	Aluminium phosphide is a highly acutely toxic substance. The acute oral LD ₅₀ of the formulation is 11.5 mg/kg. Hydrogen phosphide (phosphine) gas has an LC ₅₀ of approximately 190 ppm for a 1-hour inhalation exposure.
Routes of Exposure	The primary routes of exposure are ingestion and inhalation. Aluminium phosphide is not absorbed dermally. Ingestion of aluminium phosphide reacts with moisture and stomach acids to generate toxic phosphine gas in the gastrointestinal tract.
Skin Irritation	Aluminium phosphide is irritating to the skin.
Eye Irritation	Aluminium phosphide is irritating to the eyes.

11.2 Other Toxicological Information

Reproductive Effects	Available evidence for reproductive effects in animals suggests that such effects are not likely in humans under normal conditions.
Teratogenic Effects	Available evidence for teratogenic effects in animals suggests that such effects are not likely in humans under normal conditions.
Mutagenicity	No evidence is available indicating that aluminium phosphide or phosphine causes mutations or increases the mutation rate.
Carcinogenicity	No data are currently available to establish carcinogenic potential.
Chronic Toxicity	There is no evidence available indicating cumulative or chronic toxicity symptoms.
Health Hazard Information	Aluminium phosphide is highly acutely toxic. In contact with moisture in the air, or more rapidly with water, it releases hydrogen phosphide (phosphine) gas. Ingestion of aluminium phosphide results in the generation of phosphine in the gastrointestinal tract. Phosphine released from aluminium phosphide is highly toxic by inhalation. Appropriate precautions should be taken during first aid and medical treatment to prevent exposure of medical personnel to phosphine released from the affected person.

SECTION 12: Ecological Information

12.1 Toxicity

Ecotoxicity	This product is highly toxic to wildlife. Do not contaminate streams, rivers, ponds, groundwater or other waterways with the product or used containers. Prevent release of the product and its residues into the environment.
Octanol/Water Partition Coefficient	Not available.

12.2 Persistence and Degradability

Persistence and Degradability	Aluminium phosphide reacts and breaks down in the presence of water or moisture, producing phosphine gas. Therefore, aluminium phosphide is not expected to persist in the environment in its original form under moist conditions.
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12.3 Mobility in Soil

Mobility in Soil	Aluminium phosphide reacts with moisture and water and is therefore not expected to remain mobile in soil in its original form. Specific quantitative mobility data are not available.
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12.4 Other Adverse Effects

Other Adverse Effects	Avoid release to the environment. Do not contaminate watercourses, drains, surface water or groundwater with the product, residues or used containers.
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SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

Product Waste	Spent aluminium phosphide tablets, powder, residues and contaminated materials must be handled as hazardous waste. Residual aluminium phosphide should be completely deactivated before final disposal. Deactivation and disposal shall be carried out in accordance with the applicable local, regional and national regulations and by an authorized waste-disposal facility.
Container Disposal	Empty containers may contain residual aluminium phosphide or phosphine and shall be handled as contaminated waste. Do not reuse containers. Containers shall be disposed of in accordance with applicable regulations through an authorized waste-disposal facility. Do not burn containers or product.
After Spill or Accident	Spilled aluminium phosphide must be handled carefully because contact with moisture can generate toxic and flammable phosphine gas. Do not allow spilled material to come into contact with water or other liquids. Spillage should be collected and deactivated or disposed of by trained personnel using the appropriate protective equipment specified in Section 8. If phosphine concentration is unknown, appropriate respiratory protection for unknown concentrations shall be used.
Deactivation	Where permitted by the applicable regulations and product label, residual aluminium phosphide may be deactivated using an appropriate wet deactivation procedure under controlled, well-ventilated conditions. Deactivation must be carried out by trained personnel using appropriate respiratory and personal protective equipment. The resulting deactivated material shall be disposed of through an authorized waste-disposal facility in accordance with applicable regulations.
Special Precautions	Do not dispose of aluminium phosphide, residues or contaminated materials in drains, sewers, watercourses or other uncontrolled waste streams. Prevent environmental release during collection, deactivation, transport and disposal.

SECTION 14: Transport Information

14.1 UN Number

UN Number	UN 1397
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14.2 UN Proper Shipping Name

Proper Shipping Name	ALUMINIUM PHOSPHIDE
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14.3 Transport Hazard Class(es)

Primary Hazard Class	Class 4.3 – Substances which, in contact with water, emit flammable gases
Subsidiary Hazard Class	Class 6.1 – Toxic substances

14.4 Packing Group

Packing Group	I
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14.5 Environmental Hazards

Marine Pollutant	Yes
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14.6 Special Precautions for User

Special Precautions	Keep dry and protect from moisture. Prevent contact with water and other liquids. Handle and transport in accordance with applicable dangerous-goods transport regulations. Ensure that packaging is properly closed, secure and suitable for transport.
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14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in Bulk	Not applicable. The product is transported as packaged solid material.
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SECTION 15: Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

Poisons Schedule	Schedule 7 – Dangerous Poison.
Labelling	All necessary directions, precautions and warnings for normal use of the product are included on the approved product label.
Product Classification	The product is classified as a toxic and dangerous substance and is subject to applicable requirements for the manufacture, handling, storage, transport, use and disposal of pesticides and dangerous substances.
Transport Classification	UN 1397; Aluminium Phosphide; Class 4.3 with subsidiary risk Class 6.1; Packing Group I.

15.2 Other Regulatory Information

Risk Phrases	R15/29 – Contact with water liberates toxic, highly flammable gas. R26/28 – Very toxic by inhalation and if swallowed. R50 – Very toxic to aquatic organisms.
Safety Phrases	S1/2 – Keep locked up and out of the reach of children. S3/9/49 – Keep only in the original container in a cool, well-ventilated place. S22 – Do not breathe dust. S30 – Never add water to this product. S43 – In case of fire, use dry sand, powder or CO ₂ . Never use water.

15.3 Chemical Safety Assessment

Chemical Safety Assessment	A chemical safety assessment has not been carried out for the product as a whole.
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SECTION 16: Other Information

16.1 Full Text of H-Statements Referred to in Sections 2 and 3

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.

16.2 Abbreviations and Acronyms

AIP	Aluminium Phosphide
CAS	Chemical Abstracts Service
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
UN	United Nations
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG	International Maritime Dangerous Goods
IATA	International Air Transport Association
LC₅₀	Median lethal concentration
LD₅₀	Median lethal dose
TWA	Time-weighted average
STEL	Short-term exposure limit
IDLH	Immediately Dangerous to Life or Health

16.3 Revision Information

Issue Number	01
Issue Date	28.09.2021
Revision Number	03
Revision Date	05.08.2026
Previous Revision Date	06.07.2022
Description of Revision	Initial issue of the consolidated Safety Data Sheet covering Aluminium Phosphide 15%, 35%, 56% and 57% tablet grades.

16.4 Disclaimer

The information provided in this Safety Data Sheet is based on information available at the time of preparation and is intended to provide guidance for the safe handling, storage, use, transport and disposal of the product.

Users are responsible for determining the suitability of this information for their intended use and for complying with all applicable statutory and regulatory requirements.

No representations or warranties, express or implied, are made regarding the accuracy, completeness, merchantability or fitness of the information or product for any particular purpose, except as required by applicable law.

— **End of Safety Data Sheet** —