

# Aluminium Phosphide Pellets

## SAFETY DATA SHEET

### 1. PRODUCT & COMPANY IDENTIFICATION

**Product Name:** Aluminium Phosphide Pellets  
**Pesticide Classification:** Fumigant  
**UN No.:** 3048

<u>Supplier</u>	<u>Registration Holder</u>
Enviro Bio-Chem (Pty) Ltd	RT Chemicals
Co. Reg. No.: 2013/194774/07	Co. Reg. No.: CK87/21925/23
44 Kerk Street, Lichtenburg	44 Kerk Street, Lichtenburg
North West, South Africa 2740	North West, South Africa 2740

**Telephone:** +27 87 231 7261  
**Fax:** 086 541 7948  
**Website:** www.envirobiochem.co.za

**24 Hr Emergency Number:** Bateleur: +27 83 123 3911

#### In case of Poisoning:

Poison Information Centre: +27 82 446 8946  
Tygerberg Hospital: (+27 21) 931 6129  
Poison Emergency Enquiries: (+27 21) 689 5227

**Common Name:** Aluminium Phosphide 560g/kg Pellets  
**Chemical Name:** Aluminium Phosphide  
**Empirical Formula:** Al<sub>2</sub>P  
**RSA Reg. No.:** L6279 Act 36 of 1947  
**Namibia Reg. No.:** N-AR 1465  
**Botswana Reg. No.:** W130182

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### 2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Main Product Ingredient Name</u>	<u>CAS No.</u>	<u>Concentration</u>	<u>TLV</u>
Aluminium Phosphide	20859-73-8	56%	N/A
Ammonium Carbamate	1111-78-0	15%	N/A

<u>By-product Ingredient Name</u>	<u>CAS No.</u>	<u>Concentration</u>	<u>TLV</u>
Phosphine (PH <sub>3</sub> )	7803-51-2	N/A	0.3 ppm
Ammonia (NH <sub>3</sub> )	7664-41-7	N/A	25 ppm
Carbon Dioxide (CO <sub>2</sub> )	124-38-9	N/A	5 000 ppm

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### 3. HAZARD IDENTIFICATION

**Hazard Class:** WHO Class Ia -Extremely hazardous.

**Main Hazard:** Very toxic if swallowed or inhaled.

**Flammability:** Flammable

**Chemical Hazard:** Aluminium Phosphide reacts with water to produce phosphine (PH<sub>3</sub>). This product is formulated with 56% (minimum) aluminium phosphide and also contains ammonium carbamate and inert ingredients. Ammonium carbamate releases ammonia and carbon dioxide which serves as a warning agent. Pure phosphine gas is odourless. The garlic odour is due to a contaminant. Since the odour of phosphine may not be detected under some circumstances, the absence of a garlic odour does not mean that dangerous levels of hydrogen phosphide gas are absent.

**Biological Hazard:** Toxic to aquatic organisms.

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### 4. FIRST AID MEASURES AND PRECAUTIONS

If poisoning is suspected, do not wait for symptoms to develop. Contact a physician, the nearest hospital, or the nearest Poison Control Centre immediately.

**Symptoms of Human Poisoning:** Initial clinical signs include dilated pupils, tachycardia shock and low blood pressure. Progressive clinical signs include chest congestion, lymphocytosis, vertigo, albuminuria jaundice, haematuria, thrombocytopaenia and in most severe cases, anuria shock.

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 pain, diarrhea and dyspnea (difficulty in breathing). Symptoms of severe poisoning may occur within a few hours to several days resulting in pulmonary edema (fluid in lungs) and may lead to dizziness, cyanosis (blue or purple skin color), unconsciousness and death.

In sufficient quantity of phosphine gas affects the liver, kidneys, lungs, nervous system and circulatory system. Inhalation can cause lung edema and hyperemia, small perivascular brain hemorrhages and brain edema. Ingestion can cause lung and brain symptoms, but damage to viscera is more common. Phosphine poisoning may result in pulmonary edema, liver elevated serum GOT, LDH and alkaline phosphatase, reduced prothrombin, haemorrhage, jaundice and kidney hematuria and anuria. Pathology is characteristic of hypoxia. Frequent exposure over a period of days or weeks may cause poisoning. Treatment is symptomatic. For further information, contact the national poison center.

#### First Aid Measures:

**Skin Contact:** Remove contaminated clothing and wash before re-use. Wash affected skin areas with fresh running water and soap. Treat symptomatically. Seek medical attention. 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.

**Eye Contact:** Hold eyes open and flush immediately with clear, clean running water for at least 15 minutes. Get medical attention.

**Ingestion:** Seek immediate medical attention. Drink or administer one or two glasses of water and induce vomiting by touching back of throat with finger. Do not give anything by mouth if victim is unconscious or not alert.

**Inhalation:** Get exposed person to fresh air. Keep warm and make sure person can breathe freely. If breathing has stopped, give artificial respiration by mouth-to-mouth or other means of resuscitation. Do not give anything by mouth to an unconscious person.

**Advice to Physician:** The product is very toxic if swallowed or inhaled.

**Antidote:** Ensure fresh air and induce vomiting with 0.25 % copper sulphate solution. To control convulsions, it is recommended to use a diazepam intravenously. For adults, 510 mg every 45 hours & for children 0.1 mg every 45 hours. In case of pulmonary oedema give hypertonic glucose solution intravenously.

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## 5. FIRE FIGHTING MEASURES

**Flammability:** Flammable

**Extinguishing Agents:** Suffocate flames with sand, CO<sub>2</sub> or dry extinguishing powder. Do not use water.

**Firefighting:** Wear full protective clothing & self-contained breathing apparatus. Keep upwind.

**Special Hazards:** Fires involving phosphine or metal phosphides will produce phosphoric acid.

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## 6. ACCIDENTAL RELEASE MEASURES (SPILLAGE)

**Personal Precautions:** Wear protective clothing. Wear a self-contained breathing apparatus.

**Environmental Precautions:** Prevent spilled material from entering drains or watercourses.

**Spills:** A spill can produce high level of gas, and therefore, attending personnel must wear a self-contained breathing apparatus (SCBA) or its equivalent when the concentration of phosphine gas is unknown. Wear dry gloves when contact with the powdered formulation is likely. Do not flush spillage down the drain with water. Do not use water at any time to clean the spill. Water in contact with aluminium phosphide will rapidly accelerate to give phosphine gas. For small amount of spillage spread the material on ground to be deactivated by atmospheric moisture.

If containers have been punctured or damaged causing a leak, the product may be immediately used. The containers may temporarily be repaired by using aluminium tape. The fumigant may be transferred from the damaged containers to sound metal containers which should be sealed and properly labelled as aluminium phosphide. See the deactivation and disposal procedure in Section 13 of this document. Transport the damaged containers to an area suitable for pesticide storage for inspection.

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## 7. HANDLING AND STORAGE REQUIREMENTS

**Handling:** Avoid contact with skin, eyes and clothing. Keep away from direct sunlight, food, seed, animals, children and uniformed persons. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking or using the toilet. Remove clothing immediately if the product gets inside, then wash skin thoroughly using non-abrasive soap and put on clean clothing. Do not apply directly to areas where surface water is present.

**Storage:** Containers should be stored in a dry, ventilated area, away from heat and under lock and key. Post as a pesticide storage area. Do not contaminate water, food or feed by storing pesticides in the same areas used to store these commodities. Do not store in buildings where humans or domestic animals reside.

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## 8. EXPOSURE CONTROL / PERSONAL PROTECTION

**Exposure Limits:**

Components	Permissible Exposure Limits PEL (TWA)	Threshold Limit Value TLV (TWA)
Hydrogen Phosphide	0.3 ppm	1.0 ppm
Ammonia	50 ppm	35 ppm

**Engineering Controls:** Use outdoors in a well-ventilated area. Comply with occupational safety, environmental, fire and other applicable regulations. Wear suitable personal protective equipment.

**Personal Protective Equipment:**

**Clothing:** Long-sleeved shirt, long pants, shoes plus socks, protective waterproof (impermeable) gloves. Employee must wear appropriate protective clothing and equipment to prevent prolonged skin contact with this product.

**Gloves:** Protective waterproof (impermeable) rubber or plastic gloves are recommended.

**Eye Protection:** Wear eye protection. Where there is any possibility that an employee's eyes may be exposed to this substance the employer should provide an eye wash fountain or appropriate alternative within the immediate work area for emergency use.

**Respiratory:** A spill can produce high level of gas, and therefore, attending personnel must wear a self-contained breathing apparatus (SCBA) or its equivalent when the concentration of phosphine gas is unknown.

**Other Protection:** Do not eat, drink or smoke while handling this product. Prevent contamination of food, feeds, drinking water and eating utensils. After using this product wash hands and face before eating. Take extreme care to avoid drift. Wash accurately (preferably a shower) after work shift. Wash hands during breaks and at the end of the work with soap and water.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** White tablets or pellets or sachets.

**Odour:** Garlic or carbide.

**Vapour Pressure (Aluminium Phosphide):** 0 mm Hg; **(Phosphine gas):** 40 mm Hg at -129.4 °C

**Vapour Density:** Not available.

**Boiling Point (Aluminium Phosphide):** > 1000 °C; **(Phosphine Gas):** 87.7 °C.

**Melting Point/ Freezing Point (Aluminium phosphide):** >1000 °C; **(Phosphine Gas):** -133 °C

**Solubility:** Reacts chemically with water or dilute acids to liberate phosphine gas.

**Specific Gravity (Aluminium Phosphide):** 2.55; **(Phosphine):** 1.17

**Flash Point (Test Method):** >62 °C

**Lower Explosive Limit:** Product itself is not an explosive, however phosphine gas has LEL of 1.8 % v/v.

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## 10. STABILITY AND REACTIVITY

**Stability:** Aluminium phosphide is stable to most chemical reactions except hydrolysis to form phosphine and aluminium hydroxide.

**Condition to avoid:** Moisture and moist air.

**Incompatible Material:** Avoid contact with water and oxidizing agents.

**Decomposition Products:** Will react with moist air, water, acids and some other liquid to form toxic and flammable gases.

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## 11. TOXICOLOGICAL INFORMATION

**Acute Oral LD<sub>50</sub> (rat):** 11.5 mg/kg. Fatal if swallowed.

**Acute Dermal LD<sub>50</sub> (rabbit):** No data available.

**Acute Inhalation LC<sub>50</sub> (rat, 4 hr):** 0.014 mg/l air. Exposure can be fatal.

**Skin and Eye Irritation (rabbit):** May irritate to skin and eyes.

**Skin Sensitization (guinea pig):** No data available.

**Chronic Dietary Study:** No data available.

**Carcinogenicity:** No data available.

**Mutagenicity:** No data available.

**Reproductive Hazard:** No data available.

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## 12. ECOLOGICAL INFORMATION

Ecotoxicity is based on the formulated product toxicity.

**Aquatic Toxicity Fish LC<sub>50</sub> (96 hr):** Moderately toxic to fish.

**Aquatic Toxicity Daphnia LC<sub>50</sub> (48 hr):** 0.2 mg/l

**Aquatic Toxicity Algae EC<sub>50</sub> (5 days):** No data available.

**Avian Toxicity LD<sub>50</sub> (9 days):** No data available.

**Bee Toxicity LD<sub>50</sub>:** No data available.

**Biodegradability:** Phosphine decomposes in the atmosphere within 5 to 28 hours.

**Bio-accumulation:** No data available.

**Mobility:** No data available.

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### 13. DISPOSAL CONSIDERATION

#### Pesticide Disposal:

Wet deactivation method

1. Deactivating solution is prepared by adding the appropriate amount of low sudsing detergent to water in a drum or other suitable container. A 2% solution or 4 cups of detergent in 120 l water is suggested. The container should be filled with deactivating solution to within a few inches of the top.
2. The material is added slowly to the deactivating solution and stirred so as to thoroughly wet all of the product. This should be carried out in open air and respiratory protection may be required. At no time should the deactivation drum be covered.
3. No more than about 20-25 kg of aluminium phosphide should be added to 60 l of water detergent mixture.
4. Allow the mixture to stand, with occasional stirring, for about 36 hours. The resultant slurry of dust or packaged product will then be safe for disposal.
5. Dispose of the slurry of deactivated material, with or without preliminary decanting, at a sanitary landfill or other suitable site approved by local authorities.

**Package Product Wastes:** Emptied containers retain vapor and product residues. Observe all labelled safeguards until container is cleaned, reconditioned or destroyed. Dispose of waste product via a reputable disposal contractor to an approved landfill. Empty container and product should not be burnt.

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### 14. TRANSPORT INFORMATION

**Un No.:** 3048

**Class:** 6.1

**Packaging Group:** I

**Proper Shipping Name:** Aluminium phosphide pesticide.

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### 15. REGULATORY INFORMATION

**Risk Phrases:** R15- Contact with water liberates flammable gases.

R29- Contact with water liberates Toxic gases

R28- Very toxic if swallowed

R32- Contact with acids liberate toxic gases

**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.

S7/8- Keep container tightly closed and dry.

S13- Keep away from food, drink and animal feeding stuffs.

S20/21- When using do not eat, drink or smoke.

S22- Do not breathe dust.

**National Legislation:** This product is registered under Act 36 of 1947 of the Republic of South Africa. It is a violation of South African law to use this product in any manner inconsistent with its approved labelling. Read and follow all label directions.

## 16. OTHER INFORMATION

**Note:** Read and understand all the information on the product label before using the product.

**Disclaimer:** The information on this sheet is not a specification; it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage and use of the product. It is not applicable to unusual or non-standard uses of the product, nor where instructions or recommendations are not followed.

All information is given in good faith but without guarantee in respect of accuracy, and no responsibility is accepted for errors and omissions or the consequence thereof.

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