

SAFETY DATA SHEET

SECTION 1

IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: **Apparent Fate Fumigation Tablets**

Other Names: Metal phosphide. Group 24A Insecticide.
Use: An insecticide for the control of pests of storage silos.
Company: AIRR Apparent Pty Ltd.
Address: 15/16 Princes Street, Newport NSW 2106.
ACN/ABN: 153 573 641.
Email: enquiries@apparentag.com.au
Emergency Contact: 0411 227 338

SECTION 2

HAZARDS IDENTIFICATION

**Classified as hazardous according to criteria of Safe Work Australia.
Classified as a Dangerous Good according to the ADG Code.**

Globally Harmonised System (GHS) classification of the substance/mixture:

Substances and Mixtures Which, In Contact With Water, Emit Flammable Gases: Hazard Category 1.
Acute Toxicity - Oral - Hazard Category 1.
Acute Toxicity – Dermal - Hazard Category 3.
Acute Toxicity - Inhalation - Hazard Category 1.
Hazardous to the Aquatic Environment- Short term (Acute) Hazard - Hazard Category 1.

Signal Word: DANGER.

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.
AUH029 Contact with water liberates toxic gases.

Precautionary Statements:

Prevention:

P223 Keep cool.
P260 Do not breathe dust, fume, gas or vapours.
P264 Wash hands, arms and face 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/eye protection/face protection.
P284 In case of inadequate ventilation wear respiratory protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P302 + P335 + P334 IF ON SKIN: brush off loose particles from skin and immerse in cool water.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P310 Immediately call a POISON CENTER or doctor/physician.
P320 Specific treatment is urgent see Safety Directions on product label.
P330 Rinse mouth.
P361 + P364 Take off immediately all contaminated clothing and wash it before reuse.
P370 + P378 In case of fire: Use dry agent for extinction.

SECTION 2 HAZARDS IDENTIFICATION (Continued)**Response (Cont):**

P391 Collect spillage.

Storage

P402 + P404 Store in a dry place. Store in a closed container.

Disposal:

P501 Dispose of contents/container in accordance with national regulations.

Pictograms:**SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS****Ingredients:**

CHEMICAL	CAS NUMBER	PROPORTION
Aluminium phosphide	20859-73-8	330 g/kg
Other ingredients determined not to be hazardous		Balance

SECTION 4**FIRST AID MEASURES****FIRST AID**

Inhalation: If inhalation occurs, contact a Poisons Information Centre. Phone Australia 131 126. **Urgent hospital treatment is likely to be needed.** Remove source of contamination or move victim to fresh air. DO NOT give direct mouth-to-mouth resuscitation. To protect rescuer, use air-viva, oxy-viva or one-way mask. Resuscitate in a well-ventilated area. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary oedema can be delayed up to 48 hours after exposure.

Ingestion: If swallowed, rinse mouth thoroughly with water and contact a Poisons Information Centre. Phone Australia 13 11 26. Urgent hospital treatment is likely to be needed. Give activated charcoal if instructed. DO NOT give direct mouth-to-mouth resuscitation if swallowed. To protect rescuer, use air-viva, oxy-viva or one-way mask. Resuscitate in a well-ventilated area.

Eye contact: As product is a tablet no effects are expected. However, note that this product will react with eye moisture liberating phosphine gas which is toxic if inhaled. If irritation does occur, flush contaminated eye(s) with lukewarm, gently flowing water until the product is removed.

Skin contact: Irritation is unlikely. However, if irritation does occur, flush with lukewarm, gently flowing water until chemical is removed. Note that this product will react with skin moisture liberating phosphine gas which is toxic if inhaled.

Advice to Doctor: *Major Health Hazards:* Aluminium phosphide is not absorbed dermally; the main routes of exposure are through inhalation and ingestion. It is highly toxic via both these routes. Aluminium phosphide ingested orally reacts with water and stomach acids to produce phosphine gas, which is toxic.

SECTION 5**FIRE FIGHTING MEASURES**

Specific Hazard: WATER MUST NOT BE ALLOWED TO COME INTO CONTACT WITH THE PRODUCT SINCE A DANGEROUS REACTION WILL TAKE PLACE. Product is not flammable, but phosphine gas is flammable. There is a danger of a violent reaction or explosion if significant quantities of this product are involved in a fire.

SECTION 5 FIRE FIGHTING MEASURES (Continued)

Extinguishing media: 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. Contain all runoff.

Hazards from combustion products: This product will probably cause the fire to intensify as contents ignite. On burning will emit very toxic fumes. Firefighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to vapour or smoke. Product is unlikely to be explosive if kept dry. However, water and many liquids cause immediate release of phosphine from the product. Uncontrolled release of phosphine may result in fire or explosion and release of gas will pose a serious risk of injury to firefighters and bystanders.

Precautions for fire-fighters and special protective equipment: Isolate fire area. Evacuate downwind residents. Wear full protective clothing and self-contained breathing apparatus. Do not breathe smoke or vapours generated.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Emergency procedures: Wear full protective equipment including face mask, face shield, gauntlets and self-contained breathing apparatus.

Stop leak if safe to do so and contain spill. Avoid using sawdust or other combustible material. Because of the toxicity of this product, special personal care should be taken in any cleanup operation. Contain and absorb spilled material with absorbent material such as sand, clay, cat litter or material such as vermiculite. Collect recoverable product for use as labelled on the product. Sweep up and shovel or collect recoverable product into labelled containers for recycling or disposal and dispose of waste as per the requirements of Local or State Waste Management Authorities. Keep out animals and unprotected persons.

Methods and Materials for Containment and Cleaning Up: Sweep up and collect recoverable product into labelled containers, and dispose of promptly. Under no circumstances should any drum which contains aluminium phosphide be sealed as it may react with moisture in the container and explode.

To decontaminate spill area, tools and equipment, swamp with dilute acid or soapy water in open air until bubbling ceases and then add the solution to the drums of wastes already collected and label contents. Dispose of drummed wastes, including decontamination solution in accordance with the requirements of Local or State Waste Management Authorities.

After fumigation with the product on trays/sheets remove the spent tablets/pellets and ensure residual phosphide is destroyed before disposal, by swamping with dilute acid or soapy water in open air until bubbling ceases.

SECTION 7 HANDLING AND STORAGE

Precautions for Safe Handling: No smoking, eating or drinking should be allowed where material is used or stored. Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Avoid contact or contamination of product with incompatible materials, especially liquids.

Very dangerous. Product releases dangerous phosphine gas slowly in moist air and immediately if wet. Can kill if inhaled or swallowed. DO NOT inhale dust or vapour. Avoid contact with eyes and skin. Open container in the open air. Keep away from water and liquids. Keep away from naked flames. Forms toxic gas. Use the entire contents in one operation; if not possible, seal container thoroughly with waterproof adhesive tape or air-tight closure. Wash hands after use. When opening the container or using the product wear elbow-length PVC gloves, full face piece respirator with combined dust and gas cartridge (canister) or supplied air respirator. After each day's use wash gloves and respirator (if rubber wash with detergent and warm water).

The product may react while sealed with the moisture in the air in the container, liberating toxic phosphine gas. Phosphine may react spontaneously with oxygen. Consequently, there is a chance that when the lid is removed from a package that has been stored for a lengthy period, a flash may take place. Therefore make sure that when removing the lid, it be done in a well ventilated area, with no flammable materials close by.

SECTION 7 HANDLING AND STORAGE (Continued)

Conditions for Safe Storage: This product is a Schedule 7 Poison (S7). Observe all relevant regulations regarding sale, transport and storage of this class of poison. Store in the closed, original container in a cool, dry, well ventilated locked area, out of the reach of children and unauthorised persons and away from all dwellings, animals, food, feedstuffs, seed and fertilisers. DO NOT store or carry container in vehicle cabins (this includes glove compartments, luggage compartments or other common air-spaces).

KEEP AWAY FROM WATER AND LIQUIDS. Water and many liquids cause immediate release of phosphine from the product. Uncontrolled release of phosphine may result in fire or explosion and release of gas will pose a serious risk of injury to workers and bystanders.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines:

The following exposure limit has been assigned by Safe Work Australia to the ingredients in this product.

Chemical	TWA
Phosphine gas (Phosphine gas is liberated from this product by moisture (even moist air)).	0.42 mg/kg

TWA - Time-weight Average

Biological Limit Values:

No biological limit allocated.

Engineering controls:

Use in ventilated areas. Use fans or self-contained breathing apparatus if ventilation is not adequate. Keep containers closed when not in use.

Personal Protective Equipment (PPE):

General: Open container in the open air. Keep away from water and liquids. Keep away from naked flames. Forms toxic gas. Use the entire contents in one operation; if not possible, seal container thoroughly with waterproof adhesive tape or air-tight closure. Wash hands after use. When opening the container or using the product wear elbow-length PVC gloves, full face piece respirator with combined dust and gas cartridge (canister) or supplied air respirator. After each day's use wash gloves and respirator (if rubber wash with detergent and warm water).

Personal Hygiene: Very dangerous. Product releases dangerous phosphine gas slowly in moist air and immediately if wet. Can kill if inhaled or swallowed. DO NOT inhale dust or vapour. Avoid contact with eyes and skin. Clean water should be available for washing in case of eye or skin contamination. Wash skin before eating, drinking or smoking. Shower at the end of the workday.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White tablets/pellets.
Odour:	Produces phosphine gas which has a carbide like smell.
Boiling point:	No data available.
Freezing point:	Just below 0°C.
Solubility in Water:	Decomposes in water to produce phosphine gas.
pH:	Not available.
Specific Gravity:	Approximately 1.1
Flammability:	Not flammable (Phosphine gas is flammable).
Poisons Schedule:	S7.
Other Information:	Reacts vigorously with water, liberating toxic phosphine gas which may ignite spontaneously.

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: Product should be stable in storage for at least 2 years after manufacture. Some settling might occur, and containers should be agitated at least once every 12 months to resuspend any sediment.

SECTION 10 STABILITY AND REACTIVITY (Continued)

Conditions to avoid: This product should be kept in a cool place. Containers should be kept dry. Keep containers and surrounding areas well ventilated. Handle and open containers carefully.

Incompatible materials: Water, acids, bases.

Hazardous decomposition products: Water and many liquids cause immediate release of phosphine gas from the product. In a fire, oxides of phosphorus and other phosphorus compounds and aluminium compounds may be formed.

Hazardous reactions: Water and many liquids cause immediate release of phosphine gas from the product. Keep product dry.

SECTION 11 TOXICOLOGICAL INFORMATION

No specific data is available for this product as no toxicity tests have been conducted on this product. Information presented is our best judgement based on similar products and/or individual components. As with all products for which limited data is available, caution must be exercised through the use of protective equipment and handling procedures to minimise exposure.

Potential Health Effects:

Aluminium phosphide is not absorbed dermally. The main routes of exposure are through ingestion and inhalation. It is highly toxic via both these routes. Aluminium phosphide ingested orally reacts with water and stomach acids to produce phosphine gas. Phosphine generated in the gastrointestinal tract is readily absorbed into the bloodstream, and it is readily absorbed through the lung epithelium. Phosphine may cause denaturing of oxyhaemoglobin (the carrier for systemic distribution of oxygen) as well as enzymes important for respiration and metabolism, and may also have effects on cellular membranes. Inhaled aluminium phosphide dust undergoes the same reaction in the moist air sacs of the lung, although at a lower rate, resulting in similar local and systemic effects.

ACUTE EFFECTS

Swallowed: The reported rodent oral LD₅₀ = 11.5 mg/kg for pure aluminium phosphide. This product is very toxic if swallowed. Symptoms of mild to moderate acute aluminium phosphide toxicity include nausea, abdominal pain, tightness in chest, excitement, restlessness, agitation and chills. Symptoms of more severe toxicity include diarrhoea, cyanosis, difficulty breathing, pulmonary oedema, respiratory failure, tachycardia (rapid pulse) and hypotension (low blood pressure), dizziness and/or death. Convulsions have been reported in lab animals exposed to high concentrations of phosphine. Severe exposure may also result in proteinuria or glucosuria (low molecular weight proteins or glucose in the urine) indicating kidney damage. Data from a cohort of occupationally exposed Indian agricultural fumigation workers undergoing single exposures of approximately 1-3 mg/m³ (0.71 - 2.22 ppm) revealed reversible (within 2 weeks) symptoms of mild acute exposure.

Eye: This product may be irritating to the eyes, but is unlikely to cause anything more than mild transient discomfort.

Skin: This product may be irritating to the skin, but is unlikely to cause anything more than mild transient discomfort.

Inhaled: **Inhalation of phosphine gas is toxic.** Inhaled aluminium phosphide dust undergoes the same reaction in the moist air sacs of the lung, although at a lower rate, resulting in similar local and systemic effects.

Chronic toxicity: Rats fed aluminium phosphide-fumigated food averaging 0.51 ppm phosphine residues showed no differences from the control animals with respect to blood or urine chemistry and no observable differences in tissue structure. It was reported that workers had probably encountered similar exposures on an intermittent basis (in some cases over as long as a 20 year period) and had yet to show signs of toxicity, which suggests that chronic effects may be minor or have a very long latency period. Inhalation studies were conducted on the effects of phosphine gas on male and female rats exposed at levels of 0.5, 1.5, 4.5, 7.5 and 15 mg/m³ for six hours per day over a 13 week period. Results indicated that 15 mg/m³ was lethal to 4 of 10 female rats after three days of exposure. Significant treatment-related effects on body weight and decreased food consumption were seen across all treatment groups and sexes, but were reversible. Decreases in red-blood cell counts, haemoglobin, haematocrit and

SECTION 11**TOXICOLOGICAL INFORMATION (Continued)**

increased platelet counts were seen in male rats of the 4.5 mg/m³ group. Dose-related changes in blood urea nitrogen and other clinical parameters were also seen across exposure groups. Microscopic lesions were found in the outer cortex of the kidneys of rats exposed to 15 mg/m³, but not at lower exposure levels. All of these effects were reversible following a four-week recovery period.

Reproductive Effects: Examination of test animals revealed reversible damage to seminal vesicles in male rats exposed to 1.5 mg/m³ phosphine. Pregnancy rates for female rats exposed to 4.5 mg/m³ on days 6-10 of gestation were comparable to those in the unexposed group. No adverse effects on uterine implantation were seen in the 0.3, 3 and 4.5 mg/m³ exposure groups, although a statistically significant elevation in resorptions was seen in the 0.015 mg/m³ exposure group. However, this effect may not be dose-related as there was not increased effect with increased dose. The available evidence for reproductive effects in animals suggest that reproductive effects are not likely in humans under normal conditions.

Teratogenic Effects: No effects on foetal birth weights or sex ratios were seen in offspring of rats exposed for six hours a day on days 6-10 of gestation. The available evidence suggests that teratogenic effects are not likely in humans under normal conditions.

Mutagenic Effects: No evidence was available regarding the ability of aluminium phosphide or phosphine to cause mutations. Studies of human lymphocyte cultures exposed under laboratory conditions showed significant increases in phosphine-induced total chromosomal aberrations (e.g. gaps, deletions, breaks or exchanges) with increasing phosphine concentrations. In the same study, analysis of lymphocyte cultures drawn from fumigators (using phosphine exclusively) exposed to phosphine showed significant increases in the same types of chromosomal aberrations.

Carcinogenic Effects: No data are currently available.

Organ Toxicity: Acute toxicity resulting from aluminium phosphide exposure is apparent most immediately in the heart and lungs; it may also affect the central nervous system, liver and kidneys.

Fate in Humans & Animals: Aluminium phosphide rapidly reacts with water to form highly toxic phosphine gas. It has been reported that aluminium phosphide may be absorbed directly into the bloodstream, although this is probably a very minor route of entry. That phosphine which is not expired through the lungs may be metabolized to phosphates, hypophosphite and phosphite.

SECTION 12**ECOLOGICAL INFORMATION**

Environmental Toxicology: No data is available on this product. Exposure of turkeys and hens to 211 and 224 mg/m³ for 74 and 59 minutes respectively resulted in laboured breathing, swelling of organs, tonic-clonic convulsions and death. Due to the mechanism of action it is expected that other bird species will be affected at similar levels of exposure. As phosphine is rapidly dissipated in open air such exposure to birds is highly unlikely. Acute LC₅₀ in rainbow trout is 41 µg/L, indicating very high toxicity. No data were available on other fish or aquatic species. Exposure to fish is unlikely as aluminium phosphide will rapidly react to form phosphine gas, which although slightly soluble in water, will mainly bubble up into the air and be released. No data were available for other species.

Environmental Fate: Aluminium phosphide will break down spontaneously in the presence of water to form a phosphide gas, and so it is non-persistent and non-mobile in the soil environment and poses no risk to groundwater. It is highly unlikely that aluminium phosphide or phosphine will be found in surface waters.

SECTION 13**DISPOSAL CONSIDERATIONS**

Spills and Disposal: Persons involved in cleanup require adequate respiratory and skin protection - see Section 8. In case of spillage, contain tablets and dispose of waste in compliance with relevant local, state or territory government regulations. Keep out animals and unprotected persons. Keep material out of streams and sewers. Vacuum or shovel waste into an approved drum. Dispose of drummed wastes, including decontamination solution in accordance with the requirements of Local or State Waste Management Authorities.

SECTION 13 DISPOSAL CONSIDERATIONS (Continued)

Disposal of empty containers: Triple rinse the empty containers with soapy water to ensure residual phosphide is destroyed. Dispose of rinsings in an approved disposal pit. Destroy empty containers by breaking, crushing, or puncturing and delivering empty packaging to an approved waste management facility. If an approved waste management facility is not available, bury the empty packaging 500 mm below the surface in a disposal pit specifically marked and set up for this purpose, clear of waterways, desirable vegetation and tree roots, in compliance with relevant local, state or territory government regulations. Do not burn empty containers or product.

SECTION 14 TRANSPORT INFORMATION

Road & Rail Transport: This product is classified as a Dangerous Goods under the Australian Code for the Transport of Dangerous Goods by Road and Rail. UN 1397, Class 4.3 (Dangerous when wet), sub-class 6.1 (Toxic) Packing Group I, Proper Shipping Name ALUMINUM PHOSPHIDE. Hazchem code 4WE. Hazard Identification Number (HIN) 90. Australian Standards Initial Emergency Response Guide No. 27.

This product is a Schedule 7 Poison (S7) and must be stored, transported and sold in accordance with the relevant Health Department regulations.

SECTION 15 REGULATORY INFORMATION

Under the Standard for Uniform Scheduling of Medicines and Poisons (SUSMP), this product is a Schedule 7 poison.

This product is registered under the Agricultural and Veterinary Chemicals Code Act 1994. Product Registration No. 67374.

This product is classified as a Hazardous Substance under the criteria of Safe Work Australia. T+: Very toxic.

This product is classified as a Dangerous Good according to the ADG Code (7th Ed).

Requirements concerning special training:

Check State or Territory regulations that require people who use pesticides in their job or business to have training in the application of the materials.

SECTION 16 OTHER INFORMATION

Issue Date: 15 January 2021. Valid for 5 years till 15 January 2026. (5 year update).

Key to abbreviations and acronyms used in this SDS:

ADG Code	Australian Dangerous Goods Code (for the transport of Dangerous Goods by Road and Rail).
Carcinogen	An agent which is responsible for the formation of a cancer.
Genotoxic	Capable of causing damage to genetic material, such as DNA.
HSIS	Hazardous Substances information System.
Lacrimation	The production, secretion, and shedding of tears.
Lavage	A general term referring to cleaning or rinsing.
Mutagen	An agent capable of producing a mutation.
Pneumonitis	A general term that refers to inflammation of lung tissue.
PPE	Personal protective equipment.
Teratogen	An agent capable of causing abnormalities in a developing foetus.
TWA	The Time Weighted Average airborne concentration over an eight-hour working day, for a five day working week over an entire working life.

Safe Work Australia: Formally known as Australian Safety & Compensation Council (ASCC) which was formally known as the National Occupational Health & Safety Commission (NOHSC).

References

1. "Hazardous Chemicals Information System". Safe Work Australia HCIS website. (2021).
2. "Classifying Hazardous Substances" Safe Work Australia. August 2018.
3. Globally Harmonized System of Classification and Labelling of Chemicals (GHS). United Nations, 2009.

SECTION 16 OTHER INFORMATION (Continued)

This SDS summarises our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this SDS and consider the information in the context of how the product will be handled and used in the workplace including in conjunction with other products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company. End SDS.