

HARVESTPHOS®

MATERIAL SAFETY DATA SHEET

1. Identifikasi unsur/persiapan dari Pabrik

1.1 Identifikasi dari Unsur-unsur yang terkandung

Nama Produk : Aluminium Phosphide
Formula : ALP
% OSHA/PEL : 55-65
U.N Number N° : 1397
NFPA kode : 1124

1.2 Nama Suplier

TUOPU (Hongkong) Company Limited

1.3 Perusahaan yang melakukan Identifikasi

TUOPU (Hongkong) Company Limited

2. Informasi kandungan

Hazardous Ingredients	CAS no.	Concentration In %	Hazard class	Risks (R-phrases)	Function
Aluminium Phosphide	20859-73-8	≥ 56	4.3	6.1	Active Ingred
Ammonium Carbamate	111-78-0	< 30	-	-	Decomposition Control agent
Paraffin wax	8002-74-2	< 3.5	-	-	Stiffening agent
Other Ingredients	-	< 6.5	-	-	-

PRODUCT SPECIFICATIONS

Formulations	Tablets	Pellets	Blankets
Aluminium phosphide content %	56.0 minimum	56.0 minimum	56.0 minimum
* Tablets/pellets weight (g)	3.0 ± 0.1	0.6 ± .02	34.0 ± 0.1
* Crushing strength Mpa	Min 0.8 (8.0 kg)	Min 0.6 (6.0 kg)	-

Each tablet develops approximately 1 g of phosphine

Each tablet develops approximately 0.2 g of phosphine

*Average of 10 tablets/pellets

3. HAZARDS IDENTIFICATION

3.1 Possible hazards

Ingredients

- Hazardous decomposition products: Phosphine gas which is highly inflammable and extremely poisonous
- In the mean time Ammonium Carbamate decomposes to Ammonia and Carbon dioxide. Ammonia has irritating bad smell. The Ammonia also acts as the warning agent

3.2 Special exposure hazards

- Mild exposure causes malaise, ringing of ears, fatigue, nausea and pressure in chest
- Moderate poisoning causes weakness, vomiting, pain above the stomach, chest pain, diarrhea and difficulty breathing.
- Severe poisoning may cause fluid in the lungs, dizziness, blue or purple skin colour, unconsciousness, death

3.3 Hazardous polymerization

Hazardous polymerization will not occur

4. FIRST AID MEASURES

4.1 Symptoms of Poisoning

Symptoms of phosphine poisoning include nausea, fatigue, a feeling of oppression in the chest, headaches, and stomach pains.

4.2 Eye contact

If dust from product gets into the eyes, flush eyes with plenty of water, lifting upper and lower lids occasionally.

Apply eye drops after no more powdery residues are visible. Get medical attention.

4.3 Skin Contact

If powder or granules get on skin or clothing, brush or shake material off clothes and shoes in a well-ventilated area. Allow clothes to aerate in ventilated area prior to laundering. Do not leave contaminated clothing in occupied and / or confined areas such as automobiles, vans, motel room, etc. Wash contaminated skin thoroughly with soap and water.

4.4 After Inhalation

Immediately remove victim to fresh air and immediately leave the danger zone. Keep warm and make sure person can breathe freely. If the patient is not breathing, give artificial respiration using a respirator, or other means of resuscitation. Do not apply mouth to mouth resuscitation. Do not give anything by mouth to an unconscious person.

4.5 After Ingestion

Call a physician or poison control centre. Place patient in a flat position and allow to rest. Get the patient to drink one or two glasses of water and induce vomiting by touching back of throat.

4.6 First aid facilities

Provide washing facilities in the workplace

4.7 Medical attention

If patient has swallowed aluminium phosphide, he or she may be emitting toxic phosphine gas. Therefore, do not administer mouth to mouth resuscitation, use other forms of resuscitation.

5. FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media

The product itself does not burn

Extinguish fire in the vicinity with dry chemical, dry sand or powder or CO₂

5.2 Unsuitable extinguishing media

Do not use water, water fog, foam, alcohol foam or soda ash..

5.3 Instructions

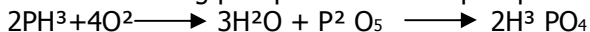
Large fires: evacuate area and let fire burn. Remove containers from fire only if it can be done without risk. Wear self-contained breathing apparatus and full protective clothing

5.4 Special protective equipment for fire-fighters

Wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in positive pressure mode.

5.5 Hazard from combustion products

Fires involving phosphine or metal phosphides will produce phosphoric acid.



6 ACCIDENTAL RELEASE MEASURE

6.1 Personal protection

See paragraf 7.3

If level of phosphine gas above 25 ppm, self-contained apparatus must be used

6.2 Environmental precautions

See paragraf 3

6.3 Steps to be taken in case of material release or spilled

Wear protective clothing. Return all intact aluminium flasks to fiber-board cases or other packing which has been suitably constructed and marked if the aluminium flasks have been punctured or damaged so as to leak, the container may be temporarily repaired with aluminium tape or the product may be transferred to metal container which must be properly sealed.

6.4 Clean-up

Don't use water to clean up spill. Wear gloves and transfer uncontaminated spill to suitable container for reuse. Contaminated spill should be deactivated by water +2% detergent

7 HANDLING AND STORAGE

7.1 Handling

- Always open containers in open air,
- vent the containers away from face and open slowly
- never open containers in a flammable atmosphere

7.2 Storage

Store under lock and key in a dry, well ventilated area away from heat. Post as pesticide storage area. Do not contaminate water, food by storing pesticides in the same areas to store these commodities. Do not store in buildings where humans or domestic animals reside. Keep out of reach of children. Product is supplied in gas tight, re-sealable aluminium flasks. Do not expose product to atmospheric moisture any longer than is necessary and seal tightly before returning opened flasks to storage.

Ventilation :

- local exhaust : maintain exposure below TLV
- Mechanical : maintain exposure below TLV
- Special : maintain exposure below TLV

Storage temperature : between - 5°C and + 30°C

7.3 Special protection information

If engineering controls, do not maintain airborne concentration to an acceptable level, a NIOSH-approved self contained breathing apparatus must be worn.

7.4 Materials for packaging

- Aluminium bottles + ABS screw top with tight washer,
- di-corrugate paper carton

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Recommended engineering controls

- Eye bath,
- Washing facilities,
- Safety shower
- Impervious clothing

8.2 Exposure limits, TLV value

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

8.3 Personal protection

- Eye protection: wear tightly glasses
- Hand protection: wear gloves
- Skin protection: wear tightly woven cotton clothing
- Materials for protective clothing : cotton
- Respiratory protection : see paragraph 7.3

9. PHYSICAL AND CHEMICAL PROPERTIES OF ALUMINIUM PHOSPHINE

9.1 Chemical formula :	AIP
9.2 Molecular weight :	57.955
9.3 Appearance (at 20°C):	Solid round tablets (pellets)
9.4 Odour:	Garlic like odour
9.5 Colour:	Grayish green or yellowish green tablets (pellets)
9.6 Specific gravity:	2.55
9.7 pH value:	N.A
9.8 Volatility by volume:	0.0
9.9 Boiling point:	> 1000 °C
9.10 Melting point :	> 1000 °C
9.11 Flash point :	N.A
9.12 Auto ignition point:	No
9.13 Flammability:	The product itself does not burn; in contact with water a highly inflammable gas is developed. When exposed to moist air, releases toxic phosphine gas which may be flammable, it also quickly gives off ammonia (NH ₃), a pungent warning gas, and carbon dioxide
9.14 Lower/upper Explosion limits:	The product in itself is not explosive
9.15 Vapour pressure (at 20°C):	Unknown
9.16 Relative density (at 20°C):	Tablets: 1.8 g/cm ³
9.17 Water solubility (at 25°C):	React
9.18 Solubility in other solvents:	Strong oxidizing agents and acids
9.19 Saturation concentration :	N.A
9.20 Stability:	Stable when dry; it reacts with moist air, and violently with acids liberating phosphine.
9.21 Reaction equation:	$AIP + 3 H_2O \rightarrow PH_3 + Al(OH)_3$ $NH_2COONH_4 \rightarrow 2NH_3 + CO_2$
9.22 Incompatibility:	Water: Avoid water Acid: Avoid Hydrochloric acid Base: N.A
9.23 Corrosivity:	Metal such as copper, brass, and other copper alloys and precious metal such as gold and silver are susceptible to corrosion by phosphine oxidizing material: Avoid strong oxidizing agent
9.24 viscosity (at 25°C):	No

10. PHYSICAL AND CHEMICAL PROPERTIES OF TECHNICAL PRODUCTS

10.1 Chemical formula :	PH ₃
10.2 Molecular weight :	33.999
10.3 Freezing point:	- 132.5 °C
10.4 Boiling point:	- 87.4 °C
10.5 Density of gas in relation to air:	1.18 (at 760 mm Hg)
10.6 Solubility in other solvents:	26% by volume at 17 °C
10.7 Ignition (inflammations):	100°C
10.8 Lower Explosion limits:	1.79 – 1.89 v%
10.9 Colour:	Colourless gas
10.10 Odour:	Carbide or garlic like odour
10.11 Odour treshold:	1.3 – 2.6 VPM
10.12 TLV:	0.3 ppm in air
10.13 Vapour pressure:	0 at 21.6 atm 20 at 34.2 atm

10.14 Latent heat of vapour: 40 at 51.9 atm
102.6 cal/g

11. STABILITY AND REACTIVITY

11.1 Stability

- under normal condition stable
- under fire condition stable
- Stable to most chemical reaction, except for hydrolysis

11.2 Reactivity, hazardous decomposition product

Hazardous decomposition product: phosphine gas

11.3 Condition / materials to avoid

Avoid contact with water, acids, strong oxidizing agents and moist air

12. TOXICOLOGICAL INFORMATION

12.1 Acute toxicity

- oral ingestion: Extremely toxic if swallowed
LD50 oral rat = 11 ppm, 4 hours
LD50 dermal rat = no Acute dermal toxicity
LD50 dermal rabbit = no Acute dermal toxicity
- eye contact: Can cause irritation
- Skin contact: May irritate skin
- Skin Absorption: Aluminium phosphide and phosphine gas are not absorbed dermally
- Inhalation: LC50 inhalation rat = 7mg/m³, 27-36 hours
PH3 190 ppm 1 hour
- Effects of over exposure: Unknown

12.2 Chronic toxicity

- Aluminium phosphide is not known to cause chronic poisoning.
- EC carcinogenicity: Aluminium phosphide is not carcinogenic and is not listed as such by NTP, IARC or OSAH.
- EC mutagenicity: No
- EC reproduction: No

12.3 Routes of exposure

- Contact with eyes, skin, CNS, respiratory & GI tracts
- Ingestion

12.4 Acute effects / symptoms

- After inhalation: May cause CNS effect, poisoning, cyanosis, unconsciousness & death
- After skin contact: N.A
- After eye contact: Can cause irritation
- Ingestion: Can be fatal

12.5 Chronic effects

- No Chronic effects

13. ECOLOGICAL INFORMATION

13.1 Mobility

N.A

13.2 Biodegradation

- Soil: Can react in the moist soil as follows: $ALP + 3H_2O \rightarrow AL(OH)_3 + PH_3$.
AL(OH)₃ isn't hazardous, PH₃ (phosphine gas) is poisonous, But they are both no hazards to environment.
- Water: Can react with water. The same as with "soil"
- Air: Can react in the moist air. The same as with "soil"

13.3 Bioaccumulation

N.A

13.4 Aquatic toxicity

- LC50 96 h: Not applicable
- EC50 48h: Not applicable
- LC50 72h: Not applicable

13.5 Other information

No other information

14. WASTE DISPOSAL CONSIDERATIONS

14.1 Disposal methods

- dry method: Dust should be deactivated outdoors, in a dry location away from inhabited buildings
- Wet method: Deactivating solution is prepared by adding the appropriate amount of low-sudsing detergent to water in a drum or other suitable container. Residual dust is poured slowly into the solution and stirred so as to thoroughly wet all of the particles.

15. TRANSPORT INFORMATION

15.1 Substance identification number

UN N°:	1397
Proper shipping name:	Aluminium phosphide
Hazards class, IMCO class:	4.3
Subsidiary Risk Class:	6.1
Hazchem code:	4WE
H. S. No:	38081090.10
EPG:	4B3
Packing group:	I
Label:	DANGEROUS WHEN WET / POISON

16. REGULATORY INFORMATION

Labeling in accordance with dangerous goods and with local directives.

Symbols T+ and F.

Empty packaging must not be re-used.

Registered according to the Regulations of Ministry of Agriculture, People's Republic of China

17. OTHER INFORMATION

The information provided in this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Legend

N.A = Not Applicable

N.D = Not Determined