

# Material Safety Data Sheet : Aluminium Phosphide 56% (Powder)

## 1. Chemical Product and Company Identification

|                                  |  |  |
|----------------------------------|--|--|
| <b>Product Name</b>              | : Aluminium Phosphide 56% (Powder)   |  |
| <b>Chemical Name</b>             | : Aluminium Phosphide  |  |
| <b>Formula</b>                   | : AIP  |  |
| <b>Molecular Weight</b>          | : 57.96  |  |
| <b>Manufacturer</b>              | : Sumitomo Chemical India Limited<br>Corporate Office : 13 / 14 Aradhana Industrial Development Corporation, Near Virwani Industrial Estate, Goregaon (East), Mumbai – 400 063 – India |  |
| <b>Emergency Contact Details</b> | : Please use emergency telephone number shown below.   |  |
| <b>Carechem24</b>                | <b>Europe</b>  | +44 1235 239670  |
|                                  | <b>Americas (except USA)</b>   | +1 215 207 0061  |
|                                  | <b>Middle East/Africa</b>  | +44 1235 239671  |
|                                  | <b>East/South East Asia</b>  | +65 3158 1074 (English)<br>'000 800 100 7479 (toll –free number, access from India only) |
|                                  | <b>Global / English speaking countries</b>   | +44 1865 407333  |
| <b>Email</b>                     | : <a href="mailto:msds@sumichem.co.in">msds@sumichem.co.in</a>   |  |
| <b>URL</b>                       | : <a href="http://www.sumichem.co.in">http://www.sumichem.co.in</a>  |  |

## 2. Composition/Information on Ingredients

| Component           | CAS No.    | % W/W content |
|---------------------|------------|---------------|
| Aluminium Phosphide | 20859-73-8 | 56 minimum    |
| Other ingredients   | -----      | Q.S.          |

## 3. Hazard Identification

|                                 |  |
|---------------------------------|--|
| <b>Emergency Overview</b>       |  |
| <b>Appearance and odour</b>     | : Dry grey colour powder, Garlic like odour      |
| <b>Warning Statements</b>       | : <b>Danger</b><br>Keep out of reach of children |
| <b>Potential Health Effects</b> | : <b>Poison</b>                                  |

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|                                 |  |
|---------------------------------|--|
| <b>Likely Routs of Exposure</b> | : Inhalation and Ingestion   |
| <b>Eye Contact</b>              | : Not classified as eye irritant   |
| <b>Skin contact</b>             | : Not classified as skin irritant or sensitizer  |
| <b>Ingestion</b>                | : Very toxic if swallowed (R28)  |
| <b>Inhalation</b>               | : Harmful and likely to cause adverse effect by this route   |
| <b>Health Hazard</b>            | : Dangerous when wet , Contact with water liberates toxic gas (R29),<br>Contact with acid liberates toxic gas ( R31) |
| <b>Physical Hazard</b>          | : Contact with water liberates extremely flammable gases (R15)   |

### 4. First aid measures and Antidote

Emergency and First Aid Procedure –

|                          |  |
|--------------------------|--|
| <b>If in Eyes</b>        | : Immediately flush with plenty of clean water for 15-20 minutes. Remove contact lenses if present after 5 minutes of washing. Get medical attention   |
| <b>If on Skin</b>        | : Take out victim to fresh air in open area. Take out clothing, safety shoes, socks; wash with plenty of clean water and soap. Get medical attention. Shake off or brush the contaminated clothing & keep it in open place for some time before washing.   |
| <b>If Inhaled</b>        | : Take out victim in fresh air, make the person lie down in comfortable position. Keep him quit and warm, if required use blanket. If feel difficulty in breathing give artificial breathing. Do not apply mouth to mouth resuscitation. Get medical attention.  |
| <b>If Swallowed</b>      | : If ingested, do not induce vomiting. Milk, fats or saline emetics should not be given orally to the victim. Give gastric lavage with potassium permanganate 0.1% Solution (1:1000). This is followed by administration of slurry of medicinal charcoal with water (1g charcoal/Kg body weight). <b>Do not administer anything orally.</b><br><br>It is important that while going for treatment or calling doctor, keep the product container or label or the applicator's manual ready with you and hand it over to doctor. |
| <b>Note to Physician</b> | : If patient has swallowed Aluminium phosphide he/she may be emitting toxic phosphine gas. First aid & medical staff must take precaution against exposure to phosphine emitted by such patient. Treat symptomatically. Give repeated gastric lavage with 0.1% potassium permanganate solution till the flushing ceases to carbide (garlic). In case of pulmonary edema, give hypertonic glucose solution intravenously.   |
| <b>Antidote</b>          | : No specific antidote known.  |

### 5. Fire Fighting Measures

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|---|---|---|
| <b>Hazardous product of Combustion</b>    | : | Aluminium phosphide as such is not flammable however in contact with moisture / water releases poisonous gas phosphine, which is flammable.   |
| <b>Extinguishing Media</b>                | : | Suffocate fire with dry sand, clay, Dry chemical powder or CO <sub>2</sub> .<br><b>DO NOT USE WATER.</b> Do not confine the spent or partially spent aluminium phosphide fumigant dust, slow release of phosphine may leads to explosive mixture.   |
| <b>Unusual Fire and Explosion Hazards</b> | : | Hydrogen phosphide (phosphine), air mixture above LEL level spontaneously catches fire. Never allow to build up the phosphine concentration above LEL. Container may get pressurized due to excessive heat during fire and lead to explosion.       |
| <b>Fire Fighting Equipment</b>            | : | Fire fighters must use self-contained breathing apparatus. Evacuate the area and fight fire from a safe distance. Approach from upwind to avoid hazardous vapours and decomposition products. Used equipment's should be thoroughly decontaminated. |

### 6. Accidental Release Measure

|   |   |  |
|---|---|--|
| <b>Personal Protection</b>                  | : | Observe all protection and safety precautions. Depending on the magnitude of the spill, use of eye protection, gloves and boots when cleaning up spills are recommended. For PPE see Section 8   |
| <b>Steps to be taken in case of a spill</b> | : | <p>It is recommended to have a predetermined plan / SOP for the handling of spills.</p> <p>Stop the source of the spill immediately, if safe to do so. Apply Aluminium tape to leaking point. Contain the spill to prevent any further contamination of soil or atmosphere. Dispose of spilled Aluminium phosphide according to label instructions.</p> <p>Keep all bystanders away. Wear full-length clothing, gloves and use self-contained breathing apparatus. Shovel and collect the spilled material / contaminated absorbent and place in suitable containers. Thoroughly scrub the floor or other impervious surfaces with a strong industrial detergent and rinse with water. If practical, use local mechanical exhaust ventilation at sources of exposure especially to speed the aeration of silos, warehouses, ship holds, containers, etc.</p> <p><b>Spills in water:</b> Evacuate the area, cordon and isolate the contaminated water. Intimate the local authority nearby area not to use the water.</p> |
| <b>Wet Deactivation</b>                     | : | <ol style="list-style-type: none"> <li>1. Prepare deactivating solution adding the appropriate amount of low sudsing detergent to water in a drum or other suitable container. Prepare 2% solution or 4 cups of detergent in 130 liters water. The container should be filled with deactivating solution up to few inches of the top.</li> <li>2. Material is added slowly to the deactivating solution under stirring so as to thoroughly wet the entire product. Use metal grid to keep the product</li> </ol>   |

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|  | <p>submerged. Keep submerge for 36 hrs. Do not cover the container. This should be done in open air with respiratory protection. Use @ 70 Liters of deactivating solution for 20-25 Kg of the product.</p> <p>3. Dispose of the slurry of deactivated material, with or without preliminary decanting, at a sanitary landfill or other suitable site approved by local authorities.</p> <p>The residual dust and spent material remaining after deactivation or fumigation will be a greyish-white, non-hazardous waste which, can be disposed of at a sanitary landfill. <b>The EPA has determined that proper disposal of Aluminium Phosphide will cause no unreasonable adverse effects on the environment.</b></p> |
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### 7. Handling and Storage

|                                |   |
|--------------------------------|---|
| <b>Precautions in Handling</b> | <p>: In an industrial environment, such as while making formulation, filling or packing, it is recommended to avoid physical contact with the product and to have adequate ventilation.</p> <p>Avoid spillage into the eyes, or contact with bare skin or clothing. Avoid inhaling vapors. Wash hands, feet, face thoroughly after handling. Remove contaminated clothing immediately.</p> <p>Avoid breathing gas from Powders or the dust rising from treated grain. Hydrogen phosphide in the head space of containers may flash upon exposure to atmospheric oxygen. When opening, point the container away from the face and body. These precautions will also reduce the risk of exposure to hydrogen phosphide gas.</p>   |
| <b>Precautions in Storage</b>  | <p>: The product is stable under normal conditions of warehouse storage. Keep container lids tightly closed.</p> <p>Always store Aluminium phosphide under lock and key in a dry, well-ventilated area away from heat. Label clearly as a pesticide storage area. Do not store in buildings inhabited by humans or animals</p> <p>Do not allow water or other liquids to contact Aluminium phosphide. Do not pile up large quantities during fumigation or disposal. Open containers only in open air. Do not open in flammable atmosphere.</p> <p>Preferably use up contents of a container at one time. Do not expose the product to atmospheric moisture.</p> $  \begin{array}{lcl}  \text{AIP} + 3\text{H}_2\text{O} & \longrightarrow & \text{Al}(\text{OH})_3 + \text{PH}_3 \\  2\text{PH}_3 + 4\text{O}_2 & \longrightarrow & 3\text{H}_2\text{O} + \text{P}_2\text{O}_5 \longrightarrow 2\text{H}_3\text{PO}_4 \\  \text{NH}_2\text{COONH}_4 & \longrightarrow & 2\text{NH}_3 + \text{CO}_2  \end{array}  $ |
| <b>Specific Use</b>            | <p>: The product is meant / approved to be used as fumigant.</p>  |

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### 8. Exposure Controls/Personal Protection

|                              |   |   |
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| <b>Exposure Limit Values</b> | : | <div> <div>OSHA PEL<br/>TWA (ppm)<br/>0.3</div> <div>ACGIH<br/>TWA (ppm)<br/>0.3</div> <div>TLV<br/>STEL (ppm)<br/>1.0</div> </div>   |
| <b>Personal Protection</b>   | : | When used in a closed / automated system, personal protection equipment may not be required. When closed system is not possible in case of manual handling, sampling, maintenance, repair, sampling etc., use suitable PPE. |
| <b>Inhalation Protection</b> | : | It is advised to use self-contained breathing apparatus (SCBA).   |
| <b>Protective Gloves</b>     | : | Use gloves.   |
| <b>Eye Protection</b>        | : | Wear goggles, face shield or safety glasses. It is recommended to have an eye wash fountain available in the work area.   |
| <b>Skin Protection</b>       | : | Wear appropriate protective clothing to prevent direct skin contact.  |

### 9. Physical and Chemical Properties

|                            |   |   |
|----------------------------|---|---|
| <b>Physical State</b>      | : | Solid   |
| <b>Appearance</b>          | : | Grey color granules                           |
| <b>Odour</b>               | : | Garlic like odour                             |
| <b>Bulk density</b>        | : | 1.0398±0.055 g/L at 20 °C (AIP 57%)           |
| <b>pH value</b>            | : | 9.20 ± 0.04 at 20 °C                          |
| <b>Viscosity</b>           | : | Data not available                            |
| <b>Vapour Pressure</b>     | : | Data not available                            |
| <b>Vapour Density</b>      | : | Data not available                            |
| <b>Melting Point</b>       | : | > 1000 °C                                     |
| <b>Boiling Point</b>       | : | Data not available                            |
| <b>Flash Point</b>         | : | Not flammable by itself                       |
| <b>Auto Ignition Temp</b>  | : | Above 620 °C                                  |
| <b>Flammable Limits</b>    | : | Not flammable in normal condition             |
| <b>Solubility in Water</b> | : | Reacts with water and liberate phosphine gas. |

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| Explosivity | : | Not explosive |
|-------------|---|---------------|

Phosphine (CAS No. 7803-51-4) : Liberates after reaction with moisture / water, details given below is of phosphine gas.

|                  |   |  |
|------------------|---|--|
| Chemical Name    | : | Phosphine, Hydrogen phosphide  |
| Molecular weight | : | 34.04  |
| Appearance       | : | Colorless  |
| Odour            | : | Odorless but technical have highly unpleasant odour like garlic, decaying fish   |
| pH               | : | Alkaline   |
| Specific gravity | : | 1.146 at 20 °C   |
| Vapour pressure  | : | 3. 4.x 10 <sup>9</sup> mPa at 20 °C  |
| Flash point      | : | spontaneously flammable at air concentrations above the LEL (Lower Explosive Limit) – 1.79% v/v or 17900 ppm or 26.1 gm/m <sup>3</sup> |
| Flammability     | : | LEL: 1.8% v/v or 17900 ppm or 26.1 gm/m <sup>3</sup>   |
| Water solubility | : | Slightly soluble in water (20 cc in 100 ml at 17 °C)   |

### 10. Stability and Reactivity

|                                 |   |   |
|---------------------------------|---|---|
| Chemical Stability              | : | Product is stable under ambient conditions of storage. The shelf life of Aluminium phosphide is more than three years if the containers are tightly sealed.   |
| Materials to Avoid              | : | Avoid contact with water, acids and other oxidizing agents. Hydrogen phosphide gas may react with certain metals (gold, silver, brass, other precious metals and their alloys) and cause corrosion especially at higher temperatures and relative humidity. |
| Hazardous Decomposition Product | : | Refer to section no. 5  |
| Hazardous Polymerization        | : | Not known   |

### 11. Toxicological Information

|                |   |                        |
|----------------|---|------------------------|
| Health Hazards | : | Refer to section no. 3 |
|----------------|---|------------------------|

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| <b>Acute Toxicity</b>    | : | The product is highly toxic. It should be treated with the usual care of handling hazardous chemicals. |
| <b>Route(s) of Entry</b> | : |  |
| Ingestion                | : | LD <sub>50</sub> , oral, (female rat) : 25 mg/kg body weight GHS Category-4                            |
| Skin                     | : | LD <sub>50</sub> , dermal, rat: : 1852.83 mg/kg body weight category-2                                 |
| Inhalation               | : | LC <sub>50</sub> , rat, value 38.945 ppm GHS category-1  |

### 12. Ecological Information

|  |   |                             |
|--|---|-----------------------------|
| <b>Toxicity date</b>   | : |                             |
| <b>Acute Oral Toxicity in Birds</b>                          | : | Data not available          |
| <b>Acute Toxicity in earthworm (14 days LC<sub>50</sub>)</b> | : | 257.3 mg/kg artificial soil |
| <b>Acute Toxicity Honey bees</b>                             | : | Data not available          |

### 13. Disposal Considerations

|                                |   |  |
|--------------------------------|---|--|
| <b>Waste Treatment Methods</b> | : | Keep out of drains, sewers, ditches and waterways.<br>Left-over material that should not be used or chemically reprocessed and should be disposed of in a landfill approved for pesticide disposal.  |
| <b>Containers</b>              | : | Emptied containers may retain Vapour and product residue. Observe all labeled safeguards until container is cleaned or destroyed.<br><br>Dispose of as hazardous industrial waste. Do not re-use containers.<br><br>Disposal of waste and packaging materials must always be in accordance with all applicable local laws/regulations. |

### 14. Transport Information

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Hazardous under the applicable ICAO/IATA, IMO, ADG

|                               |   |                               |
|-------------------------------|---|-------------------------------|
| <b>IMDG Classification</b>    |   |                               |
| <b>Proper Shipping Name</b>   | : | Aluminium Phosphide Pesticide |
| <b>Hazard class / I D No.</b> | : | 6.1                           |



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|                      |   |      |
|----------------------|---|------|
| Label                | : | -    |
| Subsidiary hazard(s) | : | -    |
| UN No.               | : | 3048 |
| Packing group        | : | I    |
| Marine pollutant     | : | Yes  |

### 15. Regulatory Information

|                   |   |   |
|-------------------|---|---|
| Contains          | : | Aluminium Phosphide (CAS No. 20859-73-8)  |
| Regulatory Status | : | The product is used as fumigant which may only be used for the applications they are registered for, in accordance with an officially approved label. |

### 16. Other Information

This MSDS is intended for worker and transport safety. It summarizes 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 MSDS 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.

This material should be handled by persons who are made aware of its hazardous properties and have been instructed in the required safety precautions.

This MSDS is not intended for product users who should refer to the product label for safety precautions applicable to them.

The information provided in this safety data sheet is believed to be accurate and reliable, but uses of the product may vary and situations unforeseen by Sumitomo Chemical India Limited may exist. The user has to check the validity of the information under local circumstances.