Material Safety Data Sheet
Zinc Phosphate

Section 1 - Product Identification

Synonym	:	Trizinc diphosphate; Zinc orthophosphate.
Chemical Formula	:	$Zn_3(PO_4)_2$
Company Identification	:	Tradeasia International Pte. Limited
Address	:	133 Cecil Street # 12-03 Keck Seng Tower, Singapore Tel: +65-6227 6365 Fax: +65-6225 6286 Email: contact@chemtradeasia.com
Recommended use	:	Used as an anti-corrosive paint primer, used in dentistry, used as a coating for metal surfaces.

Section 2 – Hazards Identification

2.1. Classification
Classification according to regulation (EC) 1272/2008 GHS
Acute Toxicity (Oral): Category 5
Chronic Aquatic Hazard: Category 1
Acute Aquatic Hazard: Category 1
Acute Toxicity (Inhalation): Category 5
Classification according to EU Directives 67/548/EEC or 1999/45/EC
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

2.2. Label elements
Symbols/Pictograms

Signal Word
Warning
Hazard Statements
H400: Very toxic to aquatic life
H333: May be harmful if inhaled
H410: Very toxic to aquatic life with long lasting effects
Precautionary Statements
P273: Avoid release to the environment.
P391: Collect spillage
P304+P312: IF INHALED: Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.
P501: Dispose of contents / container to hazardous or special waste collection area or in accordance regulations.

Section 3 – Composition/Information on Ingredients

3.1 Composition comments

Chemical Name	EC No/CAS No	Purity, %
Zinc Phosphate	7779 – 90 – 0	> 98 %

Section 4 – First-Aid Measures

4.1. Description of first aid measures

General advice

Consult a physician. Show this material safety data sheet to the doctor in attendance.

Eyes

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses. If irritation, pain, swelling, lacrimation, or photophobia persist after 15 minutes of irrigation, the patient should be seen in a healthcare facility.

Skin

Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion

Rinse mouth with water. Do not give anything by mouth to an unconscious person. If vomiting occurs, lean the patient forward or place on the left side (head-down position, if possible) to maintain open airway and prevent aspiration. Observe the patient carefully. Seek medical advice.

Inhalation

If fumes or combustion products are inhaled, remove the victim from the contaminated area to fresh air immediately. If breathing is difficult, medical oxygen may have to be administered. If breathing has stopped, give artificial respiration and seek immediate medical attention. Lay patient down. Keep warm and rested. Prostheses such as false teeth, which may block the airway, should be removed. Transport to the hospital, or see a doctor.

4.2. Most important symptoms and effects, both acute and delayed

Ingestion of large quantities of phosphate salts (over 1.0 grams for an adult) may cause an osmotic catharsis resulting in diarrhoea and probable abdominal cramps. Larger doses such as 4-8 grams will almost certainly cause these effects in everyone. In healthy individuals most of the ingested salt will be excreted in the faeces with the diarrhoea and, thus, not cause any systemic toxicity. Doses greater than 10 grams hypothetically may cause systemic toxicity.

All phosphate salts, except calcium salts, have a hypothetical risk of hypocalcaemia, so calcium levels should be monitored.

Absorption of zinc compounds occurs in the small intestine.

The metal is heavily protein bound.

4.3. Indication of any immediate medical attention and special treatment needed

Treat according to symptoms (decontamination, vital functions). All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that

overexposure to materials other than this product may have occurred. $CaNa_2EDTA$ has been used successfully to normalize zinc levels and is the agent of choice.

Section 5 – Fire Fighting Measures

5.1. Suitable Extinguishing media
Water spray or fog, foam, dry chemical powder.

5.2. Specific hazards arising from the chemical
Phosphorus oxides and zinc oxide may be formed.

5.3. Special protective actions for fire-fighters
Firefighters must be fully trained and wear full protective clothing including an approved, self contained breathing apparatus which supplies a positive air pressure within a full facepiece mask.

Section 6 – Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures
Ensure adequate ventilation, Evacuate personnel to safe areas. Keep unprotected persons away. Avoid dust formation. Avoid breathing dust, vapors. Wear respiratory protection. Wear appropriate nitrile or rubber gloves, apron and safety shoes. Avoid contact with skin, eyes and clothing. Wear safety goggles.

6.2. Environmental precautions
Waste products should be handled and disposed of in a manner which complies with local, state / federal regulations. Products may cause adverse long-term effects in the aquatic environment. Keep out of sewers, ditches or drains.

6.3. Methods and material for containment and cleaning up
Small spill: Remove all ignition sources. Clean up all spills immediately. Avoid contact with skin and eyes. Control personal contact with the substance, by using protective equipment.
Large spills: Shovel material into containers. Thoroughly sweep the area of spill to clean up any residual material.

Section 7 – Handling and Storage

7.1. Precautions for safe Handling
Ensure good ventilation / exhaustion at work place. Avoid dust generation. Wear protective clothing when risk of exposure occurs. Avoid contact with skin, eyes and clothing. Wash hands with soap and water and other exposed areas with water after handling. Handle empty containers with care. Prevent concentration in hollows and sumps.

7.2. Conditions for safe storage, including any incompatibilities
Store in original containers. Keep containers/ bags securely sealed. Store in a cool, dry area protected from environmental extremes. Store away from foodstuff containers. Check all containers are clearly labelled and free from leaks. It is recommended to store this substance away from acids and ammonia.

Section 8 – Exposure Controls/Personal Protection

8.1. Appropriate engineering controls

Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement. Provide dust collectors with explosion vents Ensure enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

8.2. Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side shields. Chemical goggles. Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique: Without touching the glove's outer surface, to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Wear safety shoes.

Respiratory protection

Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures. The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option). Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended. Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program. Use approved positive flow masks if significant quantities of dust become airborne.

Section 9 – Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Fine Powder
Appearance: white
Odor: Odorless.
pH: 5.5 – 7.5 (10% solution)
Vapor Pressure: Not applicable
Vapor Density: Not applicable
Evaporation Rate: Not applicable
Boiling Point: Not applicable
Melting Point: > 900 ^{o}C

Decomposition Temperature: Not available
Solubility: < 0.02%
Specific Gravity: 3.3 – 3.4 g/cm^3

Section 10 – Stability and Reactivity

10.1. Reactivity
Not inherently chemically reactive.

10.2. Chemical stability
Stable under normal temperatures and pressures.

10.3. Possibility of hazardous reactions
Under normal conditions of storage and use, hazardous reactions will not occur. Hazardous polymerisation will not occur.

10.4. Conditions to avoid:
Incompatible materials, humidity.

10.5. Incompatible materials
Avoid reactions with peroxides, oxidizing and reducing agents,

10.6. Hazardous decomposition products
Phosphates are susceptible to formation of highly toxic and flammable phosphine gas in the presence of strong reducing agents such as hydrides. Partial oxidation of phosphates by oxidizing agents may result in the release of toxic phosphorus oxides.

Section 11 – Toxicological Information

11.1 Health effects associated with ingredients
Acute toxicity
LD50 oral (rat Wistar): > 5 000 mg/kg. Klein & Glaser based on cross-reading from zinc oxide
LC50 Inhalation of dusts and mists: >5.7 mg/L 4H (Klimisch and all 1982) based on cross-reading from zinc oxide
Skin corrosion/irritation
No irritation.
Serious eye damage/eye irritation
No irritation.
Respiratory or skin sensitization
Irritant.
Germ cell mutagenicity
Not active in genetics assay.
Carcinogenicity
Not available.
Reproductive toxicity
Not available.

Specific target organ toxicity - single exposure
Not available.
Specific target organ toxicity - repeated exposure
Long term exposure to high dust concentrations may cause changes in lung function (i.e. pneumoconiosis) caused by particles less than 0.5 micron penetrating and remaining in the lung. A prime symptom is breathlessness. Lung shadows show on X-ray.
Aspiration hazard
Not available.

Section 12 – Ecological Information

12.1.Ecotoxicity
Acute toxicity:
Acute toxicity for fish (*Oncorhynchus mykiss*) as zinc ion: LC50: 0.14 – 2.6 mg Zn^{2+}/l. (96 h)
Acute toxicity for crustacea (*Ceriodaphnia dubia*) as zinc ion: EC50: 0.413 mg Zn^{2+}/l. for pH <7 (48 h)
Acute toxicity for algae (*Selenastrum capricornutum*) as zinc ion: EC50: 0.136– 0.150 mg Zn^{2+}/l. (72 h)
Chronic toxicity:
Expressed as Zn^{+2}:
Freshwater: The chronic aquatic toxicity database on zinc contains high quality chronic NOEC (No observed effect concentration)/EC10 values on 23 species (8 taxonomic groups) obtained under a variety of conditions.
Marine water: The chronic aquatic toxicity database on zinc contains high quality chronic NOEC/EC10 values on 39 species (9 taxonomic groups) obtained under a variety of conditions.
Expressed as Zn:
Zinc sediment toxicity: The chronic toxicity of zinc to sediment organisms in the freshwater was assessed based on a database containing high quality chronic NOEC/EC10 values on 7 benthic species obtained under a variety of conditions.
Zinc Soil toxicity: The chronic toxicity of zinc to soil organisms was assessed based on a database containing high quality chronic NOEC/EC10 values on 18 plant species, 8 invertebrate species and 17 microbial processes, obtained under a variety of conditions.

12.2. Bioaccumulative potential
Zinc has low bioaccumulative potential. It is due to the fact that zinc is a natural, essential element, which is needed for the optimal growth and development of all living organisms, including *homo sapiens*. All living organisms have homeostasis mechanisms that actively regulate zinc uptake and absorption/excretion.

12.3. Mobility in soil
For zinc (like for other metals) the transport and distribution over the different environmental compartments e.g. water or soil, is described and quantified by the metal partition coefficients between these different fractions. In the CSR, a solids-water partitioning coefficient of 158.5 l/kg (log value 2.2) was applied for zinc in soils.

12.4. Persistence and Degradability
Not persistent and not biodegradable, because it is an inorganic compound.

Section 13 – Disposal Considerations

13.1. Disposal methods

Material: Reduce as possible the amount of waste containing zinc phosphate. It is possible that contaminated waste may meet the criteria of hazardous waste. Disposal should be in accordance with applicable regional, national and local laws and regulations.
Method: The generation of waste should be avoided or minimized wherever possible. Avoid dispersal or spilled material and runoff and contact with soil, waterways, drains and sewers. This product is recyclable.
Contaminated packaging: Do not reuse empty containers /Bags. Dispose of as unused product, Recommend decontaminated with water, or other means to prevent unauthorized use of used containers/ bags as per comply with local regulations for disposal.

Section 14 – Transport Information

14.1. ADR/RID

UN number	UN3077
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc phosphate)
Transport hazard class	9
Packing Group	III

14.2. IMDG

UN number	UN3077
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc phosphate)
Transport hazard class	9
Packing Group	III
Marine pollutant	Yes

14.3. IATA

UN number	UN3077
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc phosphate)
Transport hazard class	9
Packing Group	III

Section 15 – Regulatory Information

15.1. Safety, health and environmental regulations
Listed on United States inventory (TSCA 8b).

Section 16 : Additional Information

16.1. List of abbreviation and acronyms used in this MSDS
SDS : Safety Data Sheets
Index N° : atomic number of the element most characteristic of the properties of the substance
CAS No : Chemical Abstracts Service number
EC No : EINECS Number : European Inventory of Existing Commercial Substances
Repr. Cat. 2 : Substance presumed human reproductive toxicant

Acute Oral Cat. 5 : Substance which is of relatively low acute oral toxicity.
GHS : Globally Harmonised System of Classification and Labelling
LD_{50} : Median Lethal Dose
LC_{50} : Lethal Concentration, 50%
N.A. : Not Applicable
OSHA : Occupational Safety & Health Administration
Cal OSHA : The State of California Division of Occupational Safety and Health (DOSH)
PEL : Permissible Exposure Limits
ACGIH : American Conference of Governmental Industrial Hygienists
TLV : Threshold Limit Value
Japanese MITI : Japanese Ministry of International Trade and Industry
EC_{50} : Half maximal effective concentration
UN : United Nations
U.S. EPA TSCA Inventory: Inventory of the chemical substances manufactured or processed in the United States according to Toxic Substances Control Act compiled and published under the authority of the Environmental Protection Agency
Canadian DSL: Canadian Domestic Substances List

16.2. List of relevant hazard statements and precautionary statements used in this MSDS
Hazard Statements
H400: Very toxic to aquatic life
H333: May be harmful if inhaled
H410: Very toxic to aquatic life with long lasting effects
Precautionary Statements
Prevention
P273: Avoid release to the environment.
Response
P391: Collect spillage
P304+P312: IF INHALED: Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.
Disposal
P501: Dispose of contents / container to hazardous or special waste collection area or in accordance regulations.

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