MATERIAL SAFETY DATA SHEET

ZINC PHOSPHATE

1. Identification of Substance and Manufacturer

1.1 Product details

Product name	:	**Zinc phosphate**
Other Name	:	ZnC, Trizinc – bis – (orthophosphate), Trizinc diphosphate; Zinc orthophosphate; Phosphoric acid zinc salt (2:3).
CAS No.	:	7779 – 90 – 0
Chemical Formula	:	$Zn_3(PO_4)_2.2H_2O$
Molecular weight	:	422.12 g/mole
Relevant identified uses	:	As a Zinc rich anti corrosive paint primer. Used in dental cements, conversion coating of steel, aluminium and other metal surfaces.

1.2 Company details

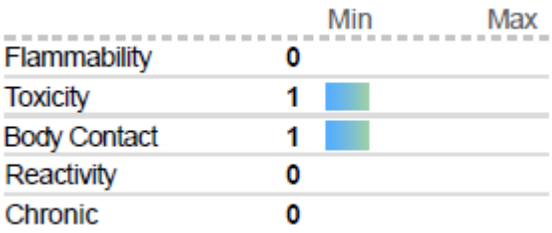
TRANSPEK – SILOX INDUSTRY PRIVATE LIMITED
Kalali Road, Atladra, Vadodara – 390 012, Gujarat, India
Telephone : +91 265 2680401-05
Fax : +91 265 2680407 / 2680062

1.3 Emergency contact details

Telephone: +91 265 2680401, Email: info@transpek-silox.com
Contact Person: Factory Manager

2. Hazard identification

2.1 Classification according to regulation (EC) 1272/2008 [EU-GHS/CLP]



Acute Toxicity (Oral)	Chronic Aquatic Hazard	Acute Aquatic Hazard	Acute Toxicity (Inhalation)
Category 5	**Category 1**	**Category 1**	**Category 5**

	NFPA Rating	HMIS Rating
Health	1	1
Flammability	0	0
Reactivity	0	0

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ZINC PHOSPHATE

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

OSHA hazard category

The substance is not classified as hazardous.

2.2 Labeling elements according Regulation (EC) No 1272/2008 [CLP]

Pictogram

GHS09

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 ***(Prevention)***	:	P273 – Avoid release to the environment.
Precautionary statements ***(Response)***	:	P391 – Collect spillage
	:	P304+P312 IF INHALED: Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.
Precautionary statements ***(Disposal)***	:	P501 – Dispose of contents / container to hazardous or special waste collection area or in accordance regulations.

3. Composition / Information on ingredients

According to regulation 1994 / 2012 OSHA Hazard communication standard: 29 CFR Part 1910.1200

CAS No.	Content	Substance Name	EINECS / EC No
7779 – 90 – 0	≥ 98 %	Zinc phosphate	231 – 944 – 3

MATERIAL SAFETY DATA SHEET

ZINC PHOSPHATE

4. First-aid measures

4.1

- **General advice:**

Consult a physician. Show this MSDS to the doctor.

- **In case of skin contact:**
  - Flush skin and hair with running water (and soap if available).
  - Seek medical attention in event of irritation.
- **If inhaled:**
  - If fumes or combustion products are inhaled remove from contaminated area to fresh air immediately.
  - If breathing is difficult, medical oxygen may 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 airway, should be removed, where
  - Transport to hospital, or doctor.
- **In case of eye contact:**
  - Remove contact lenses and irrigate exposed eyes with copious amounts of water for at least 15 minutes.
  - Ensure complete washing of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
  - If irritation, pain, swelling, lacrimation, or photophobia persist after 15 minutes of irrigation, the patient should be seen in a healthcare facility
- **If swallowed:**
  - Rinse mouth with water.
  - Avoid to give anything by mouth to an unconscious person, consult a physician.
  - If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
  - Observe the patient carefully.
  - Seek medical advice.
- **Note to physician:**

Treat according to symptoms (decontamination, vital functions).

- **Phosphate salts intoxication:**
  - 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.
  - 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.
  - Treatment should take into consideration both anionic and cation portion of the molecule.
  - 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.
  - Elimination results primarily from faecal excretion.
  - The usual measures for decontamination (Ipecac Syrup, lavage, charcoal or cathartics) may be administered, although patients usually have sufficient vomiting not to require them.
  - $CaNa_2EDTA$ has been used successfully to normalise zinc levels and is the agent of choice.

MATERIAL SAFETY DATA SHEET

ZINC PHOSPHATE

5. Fire-fighting measures

5.1 Extinguishing media: Water spray or fog, Foam, Dry chemical powder

- *Suitable extinguishing media:*

  Product is not flammable,

  *Unsuitable extinguishing me*dia: None known

5.2 Special hazards arising from the substance:

- *Hazards during fire – fighting:* Phosphorus oxides and zinc oxide may be formed.

5.3 Precautions for fire-fighters:

- *Protective equipment:*

Fire fighters 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 face piece mask.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- *Eyes:* Wear safety goggles.
- *Skin:* Wear appropriate nitrile or rubber gloves, apron and safety shoes. Avoid contact with skin, eyes and clothing.
- *Inhalation:* Avoid dust formation. Avoid breathing dust, vapors. Wear respiratory protection.
- *Other:* Ensure adequate ventilation, Evacuate personnel to safe areas. Keep unprotected persons away.

See Section 8

6.2 Environmental precautions

Waste product should be handled and disposed of in a manner which complies with local, state / federal regulations. Product may cause adverse long-term effects in the aquatic environment. Keep out of sewers, ditches or drains.
See Section 12

6.3 Method 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 area of spill to clean up any residual material.

6.4 Evacuation procedures

Isolate the spill area to prevent people from entering it until the clean up is complete

7. Handling and storage

7.1 Precautions for safe handling

- Ensure good ventilation / exhaustion at work place.
- Keep containers/bags sealed.
- Store in cool and dry place.
- Closed containers/ bags should be opened in well – ventilated area.
- Avoid dust.
- 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 Precautions for safe storage

- 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.

7.3 Storage incompatibility

- Avoid or control reaction with peroxides. All transition metal peroxides should be considered as potentially explosive.
- Phosphates are incompatible with oxidising and reducing agents.
- 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.

8. Exposure controls and personal protection

8.1 Control parameters:

Compound with occupational exposure limits.

The product does not contain any relevant quantity of materials with critical values that have to be monitored at the work place.

- *Additional information / advice about design of technical systems:*

Parameters of exposure controls: Total dust

Designation	Type of Data	Unit
Total dust, (no special effect)	ACGIH-91/93	
	TLV: TWA (USA)	10 mg/m3
	MAK (Germany)	6 mg/m3 Valid as per (mm/yy) : 05 / 95
	VME France 8H	10 mg/m3
	VME France 8H	5 mg/m3 respirable dust

- *Emergency Limit:*

TEEL-1	TEEL-2	TEEL-3
12 mg/m^3	**36 mg/m^3**	**220 mg/m^3**

- *Additional information / advice about design of technical systems:*

Provide local exhaust ventilation to control vapors / mists.

Use properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minutes.

8.2 Exposure controls:

- *General protective hygienic measures:*

Keep away from foodstuffs, beverages and food, Instantly remove any solid and impregnated garments, wash hands during breaks and at the end of the work, Maintain an ergonomically appropriate working environment, Handle in accordance with safety practice.

- *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

Process controls which involve changing the way a job activity or process is done to reduce the risk.

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.

- *Personal protective equipments*




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 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.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- Polychloroprene.
- Nitrile rubber.
- Butyl rubber.

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 mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

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ZINC PHOSPHATE

9. Physical and chemical properties

a.	**Physical state at 20 ^{0}C**	Fine Powder
b.	**Colour**	White
c.	**Odour**	Odorless
d.	**pH of 10% solution**	5.5 – 7.5
e.	**Melting point**	> 900 ^{0}C
f.	**Boiling point**	Not determined
g.	**Flash point**	Not applicable.
h.	**Specific Gravity**	3.3 – 3.4 g/cm^3
i.	**Solubility**	< 0.02%
j.	**Auto-ignition temperature (^{0}C)**	Not applicable.
k.	**Explosion lower/upper limit %**	Not explosive.
l.	**Partition coefficient n- octanol / water at 20 ^{0}C**	Not applicable.
m.	**Evaporation rate**	The product is non volatile solid.
n.	**Vapour pressure**	Not applicable.
o.	**Viscosity**	Not applicable as product is solid

10. Stability and reactivity

10.1 **Reactivity:** Not inherently chemically reactive.
See Section 7

10.2 **Stability:**

- Stable under recommended storage conditions.
- Unstable in the presence of incompatible materials.
- Hazardous polymerisation will not occur.

10.3 **Possibility of hazardous reactions:** Under normal conditions of storage and use, hazardous reactions will not occur.
See Section 7

10.4 **Material to avoid / Incompatible material:** Acids, oxidizing agents.
See Section 7

10.5 **Condition to avoid:** Avoid humidity**,** Keep away from acid & alkali.
See Section 7

10.6 **Hazardous decomposition products:** Under normal conditions of storage and use, hazardous decomposition products should not be produced.
See Section 5

11. Toxicological information

11.1 Primary routes of exposure:

Routes of entry for compounds are ingestion and inhalation but may also include eye and skin contact.

- Inhaled:

Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.

Practical experience suggests that the material may produce irritation of the respiratory system, in a significant number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.

Inhalation of freshly formed zinc oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever", with symptoms resembling influenza. Symptoms may be delayed for up to 12 hours and begin with the sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalised feeling of malaise. Mild to severe headache, nausea, occasional vomiting, fever or chills, exaggerated mental activity, profuse sweating, diarrhoea, excessive urination and prostration may also occur.

- Eye:

Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result. The material may produce foreign body irritation in certain individuals.

- Ingestion:

Accidental ingestion of the material may be damaging to the health of the individual.

Soluble zinc salts produces irritation and corrosion of the alimentary tract (in a manner similar to copper salts) with pain, vomiting, etc. Delayed deaths have been ascribed to inanition (weakness and extreme weight loss resulting from prolonged and severe food insufficiency) following severe strictures of the oesophagus, and pylorus. Vomiting, abdominal cramps, and diarrhea, in several cases with blood, have been observed after ingestion of zinc sulphate. Several cases of gastrointestinal disturbances have been reported after ingestion of zinc sulfate. A significant reduction in erythrocyte superoxide dismutase activity (47% decrease), hematocrit, and serum ferritin, compared to pretreatment levels, occurred in female subjects who received upplements (as capsules) of 50 mg zinc/day as zinc gluconate for 10 weeks.

Phosphates are slowly and incompletely absorbed from the gastrointestinal tract and are unlikely (other than in abuse) to produce the systemic effects which occur when introduced by other routes. Such effects include vomiting, lethargy, fever, diarrhoea, falls in blood pressure, slow pulse, cyanosis, carpal spasm, coma and tetany. These effects result following sequestration of blood calcium.

Ingestion of large amounts of phosphate salts (over 1 gm for an adult) may produce osmotic catharsis resulting in diarrhoea and probably, abdominal cramp.

- Chronic

Repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

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.

Dogs given daily doses of sodium phosphate dibasic for 9-22 weeks showed calcium deposits in the kidneys (nephrocalcinosis) with disseminated atrophy of the proximal tubule. Animals fed on sodium phosphate dibasic and potassium dihydrogen phosphate, in both short- and long-term studies, showed increased bone porosity; hyperparathyroidism and soft tissue calcification were also evident.

Zinc is necessary for normal fetal growth and development. Fetal damage may result from zinc deficiency. Only one report in the literature suggested adverse developmental effects in humans due to exposure to excessive levels of zinc. Four women were given zinc supplements of 0.6 mg zinc/kg/day as zinc sulfate during the third trimester of pregnancy.

- Skin Contact

The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models).

Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

Open cuts, abraded or irritated skin should not be exposed to this material

Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Information on toxicological effects
Acute toxicity :

LD50 oral (rat Wistar): > 5 000 mg/kg. Klein & Glaser based on cross-reading from zinc oxide
LC50 Inhalation Dusts and mists: >5.7 mg/L 4H (Klimisch and all 1982) based on cross-reading from zinc oxide

Additional information:

With LD50 values consistently exceeding 2,000 mg/kg bw, slightly soluble compounds such as, trizinc bis(orthophosphate) (LD50 is > 5,000) show low level of acute oral toxicity, not leading to classification for acute oral toxicity.

Trizinc – bis-(orthophosphate), (based on cross-reading from zinc oxide) is of low acute inhalation toxicity (i.e., LC50 values of > 5.7 mg/L/4Hrs), not leading to classification for acute inhalation toxicity.

Skin irritation: not irritant (based on cross-reading from ZnO : Löser, 1977; Lansdown, 1991)

Serious eye damage/eye irritation: not irritant (Mirbeau et al, 1999)

Respiratory sensitization: No not irritant (based on cross-reading from ZnO: Klimish et al, 1982)

Sensitization: No sensitizing effects known (based on cross-reading from ZnO: Van Huygevoort, 1999 g,h)

Germ cell mutagenicity: Not active in genetics assay.

Carcinogenicity:

No experimental or epidemiological evidence exists to justify classification of zinc compounds for carcinogenic activity (based on cross-reading between Zn compounds); no classification for carcinogenicity required (Chemical Safety report (CSR) Trizinc-bis-(orthophosphate). 2010).

Reproductive toxicity:
No experimental or epidemiological evidence exists to justify classification of zinc compounds for reproductive or developmental toxicity (based on cross-reading between Zn compounds); no classification for reproductive toxicity required (Chemical Safety report (CSR) Trizinc bis(orthophosphate). 2010).

12. Ecological information

12.1 Zinc Acute aquatic toxicity

The Acute aquatic toxicity database on zinc contains data on 11 standard species obtained under standard testing conditions at different pH and hardness. The full analysis of these data is given in the CSR.

The reference values for acute aquatic toxicity, based on the lowest observed EC50 values of the corresponding databases at different pH and expressed as Zn2+ ion concentration are:

Acute toxicity for fish (Oncorhynchus mykiss) as zinc **LC50** (96 h) 0.14 – 2.6 mg Zn2+/l.

Acute toxicity for crustacea (Ceriodaphnia dubia) as zinc **EC50** (48 h) 0.413 mg Zn2+/l. for pH <7

(48 hr Ceriodaphnia dubia test according to US EPA 821-R-02-012 standard test protocol reference: Hyne et al 2005)

Acute toxicity for algae (Selenastrum capricornutum) as zinc **EC50** (72 h) 0.136– 0.150 mg Zn2+/l.

(=Pseudokircherniella subcapitata) test according to OECD 201 standard protocol; reference: Van Ginneken, 1994)

After applying the molecular weight correction (transformation/dissolution testing is not relevant since this zinc compound is considered rather soluble), the specific reference values for acute aquatic toxicity of zinc orthophosphate is (applying a PZ20 $Zn_3(PO_4)_2$,$4H_2O$/Zn molecular weight ratio of 2.33 and a PZW2 Zn3(PO4)2,2H2O/Zn molecular weight ratio of 2,15):

Acute toxicity for fish (Oncorhynchus mykiss) as PZ20 **LC50** (96 h) 0.33 – 6.06 mg PZ20/L.

PZW2 **LC50** (96 h) 0.30 – 5.59 mg PZW2/L

Acute toxicity for crustacea (Ceriodaphnia dubia) as PZ20 **EC50** (48 h) 0.96 mg PZ20/L. for pH <7

PZW2 **EC50** (48 h) 0.89 mg PZW2/L. for pH <7

(48 hr Ceriodaphnia dubia test according to US EPA 821-R-02-012 standard test protocol reference: Hyne et al 2005)

Acute toxicity for algae (Selenastrum capricornutum) as PZ20 **EC50** (72 h) 0.32 mg PZ20/L.

PZW2 **EC50** (72 h) 0.29 mg PZW2/L.

(=Pseudokircherniella subcapitata) test according to OECD 201 standard protocol; reference: Van Ginneken, 1994)

M Factor for this substance is **1** for an equivalent LC50 [0.1-1.0]mg/l (GHS or 1272/2008/EC regulation).

12.2 Zinc Chronic aquatic toxicity:

Freshwater: The chronic aquatic toxicity database on zinc contains high quality chronic NOEC (No observe effect concentration)/EC10 values on 23 species (8 taxonomic groups) obtained under a variety of conditions. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as Zn2+ ion concentration). This PNEC is an added value, i.e. it is to be added to the zinc background in water, see below.

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. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as Zn2+ ion concentration). This PNEC is an added value, to be added on the zinc background in water.

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. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as total Zn contained in the sediment). This PNEC is an added value, to be added on the zinc background in the sediment, see table below. For the marine sediments, a PNEC was derived using the equilibrium partitioning approach.

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. These data, outlined in the CSR, were compiled in a species sensitivity distribution, from which the PNEC was derived (expressed as total Zn contained in the soil). This PNEC is an added value, to be added on the zinc background in the soil.

Zinc Toxicity to micro-organisms in STP: The PNEC for STP was derived from the NOEC: NOEC (No observe effect concentration) value of 100 µg Zn/l of Juliastuti et al. (2003) is set, applying an assessment factor of 1.

Persistence and biodegradability: Zinc is an element, and as such the criterion "persistence" is not relevant for the metal and its inorganic compounds in a way as it is applied to organic substances. An analysis on the removal of zinc from the water column has been presented as a surrogate for persistence. The rapid removal of zinc from the water column is documented in the CSR. So, zinc and zinc compounds do not meet this criterion, neither.

Zinc Behavior in the environmental compartments

Bioaccumulative potential: Zinc is a natural, essential element, which is needed for the optimal growth and development of all living organisms, including man. All living organisms have homeostasis mechanisms that actively regulate zinc uptake and absorption/excretion from the body; due to this regulation, zinc and zinc compounds do not bioaccumulate or biomagnify.

Mobility in soils: For zinc (like for other metals) the transport and distribution over the different environmental compartments e.g. the water (dissolved fraction, fraction bound to suspended matter), soil (fraction bound or complexed to the soil particles, fraction in the soil pore water,...) 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 (CSR zinc 2010).

12.3 Results of PBT and vPvB assessment: Zinc and zinc compounds are not PBT or vPvB.

13. Disposal considerations

13.1 Waste treatment method

A Hierarchy of Controls.

- Reduction
- Reuse
- Recycling

Disposal (if all else fails)

This substance does not meet the definition of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

The material does not have an EPA waste number and is not a listed waste. Keep out of sewers, ditches or drains. All wastes must be handled and disposed of in accordance with applicable regulations.

Material: Reduce as possible the amount of waste containing zinc phosphate. It is possible that contaminated waste may meet with the criteria of hazardous waste. Dispose in accordance with local environmental 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. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. This product is recyclable. Consideration of disposal via this route should be given.

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

The information offered in this section is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the product and alter the waste classification and proper disposal methods.

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14. Transportation information

14.1 Not classified as hazardous under transport regulations (ADR / RID / ADNR / IMDG/ ICAO / IATA)

14.2 UN-Number

ADR/RID: 3077 IMDG: 3077 IATA: 3077

14.3 UN proper shipping name

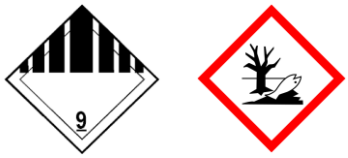
ADR/RID	IMDG	IATA
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc phosphate)		

14.4 Transport hazard class : ADR/RID: 9, IMDG: 9, IATA: 9

14.5 Packaging group: ADR/RID: III, IMDG: III, IATA: III

14.6 Environmental hazards: ADR/RID: No, IMDG: Yes, Marine pollutant, IATA: No

14.7 Labeling



14.8 Additional information

- *ADR/RID classification:*

Special provision AU01 – (page 298 ADG). Environmentally Hazardous substances meeting the descriptions of UN 3077 or UN3082 are not subject to this code when transported by road or Rail in Packagings; IBC's or any other receptacle not exceeding 500kg (L).

14.9 Special precautions for users

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3 for single packaging and combination packaging containing inner packaging with Dangerous Goods > 5L for liquids or > 5kg for solids

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15. Regulatory information

Hazard Statement: *See section 2.2*

Precautionary Statement: *Se section 2.2*

U.S. Federal regulations

United States inventory (TSCA 8b): All components are listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Listed

Clean Air Act Section 602 Class I Substances: Not listed

Clean Air Act Section 602 Class II Substances: Not listed

DEA List I Chemicals (Precursor Chemicals): Not listed

DEA List II Chemicals (Essential Chemicals): Not listed

16. Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgment of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

We support worldwide Responsible care initiative. We value and care our employees, customers, suppliers and neighbors and the protection of the environment.

Our commitment to Responsible care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our product and minimizing the impact of our operations on society and the environment during manufacturing, storage, transport, use and disposal of our products.

Disclaimer:

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----------***End of MSDS***----------