



TETRA Micronutrients

Material Safety Data Sheet

This MSDS complies with the style format specified by ANSI Z400.1 - 1993

SECTION 1: CHEMICAL PRODUCT - COMPANY IDENTIFICATION

TETRA Micronutrients

230 Spring Hill Dr., Suite 310
The Woodlands, Texas 77386
(281) 419-9430
(800) 521-9979

(800) 424-9300 - CHEMTREC (24 Hour Emergency Response)

PRODUCT: Feed Grade Powder Low Cadmium

TRADE NAMES: Super Fine Zink®, Feed Grade Powder Low Cadmium

SYNONYMS: Zinc Sulfate Monohydrate

CHEMICAL FAMILY: Inorganic Salt

MSDS CREATION DATE: 14 NOV 08

MSDS REVISION DATE: 24 AUG 09

SECTION 2: COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENTS: Zinc Sulfate Monohydrate

FORMULA: $ZnSO_4 \cdot H_2O$

CAS NUMBER: 7446-19-7 (Zinc Sulfate Monohydrate)

PERCENTAGE: 99% Zinc Sulfate Monohydrate
≤1% Water

PERMISSIBLE EXPOSURE LIMITS (OSHA/ACGIH/OTHER): Not established

PROBABLE CONTAMINANT: None

SECTION 3: HAZARDS IDENTIFICATION

NFPA RATINGS: (SCALE 0-4): HEALTH=1, FIRE=0, REACTIVITY=0

EMERGENCY OVERVIEW: White, free-flowing powder. Avoid contact with eyes and/or skin. May cause respiratory tract, skin and eye irritation, possibly severe. Wash thoroughly after handling. Work in well ventilated area.

POTENTIAL HEALTH EFFECTS:

INHALATION:



TETRA MICRONUTRIENTS

Feed Grade Powder Low Cadmium

08-24-09

TETRA Micronutrients

Material Safety Data Sheet

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Short Term Effects: May cause irritation of the nasal membranes and upper respiratory tract, possibly severe. Additional effects may include difficulty breathing, low blood pressure, dizziness, bluish skin color and lung congestion.

Long Term Effects: In addition to short term exposure, digestive disorders may occur.

SKIN CONTACT:

Short Term Effects: May cause irritation, possibly severe.

Long Term Effects: Same effects as short term exposure.

EYE CONTACT:

Short Term Effects: Contact may cause irritation, possibly severe. Additional effects may include tearing and/or blurred vision.

Long Term Effects: Same effects as short term exposure.

INGESTION:

Short Term Effects: May cause burns. Additional effects may include fever, nausea, vomiting, diarrhea, stomach pain, blood in the stool, inability to urinate, low blood pressure, kidney damage, liver damage and convulsions.

Long Term Effects: Same effects as reported in short term ingestion.

CARCINOGEN STATUS:

OSHA: No **NTP:** No **IARC:** No

SECTION 4: FIRST AID MEASURES

INHALATION: Remove from exposure area to fresh air immediately. If breathing is difficult, give oxygen. If breathing has stopped, perform artificial resuscitation. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

SKIN CONTACT: Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of product remains (at least 15-20 minutes). If burns occur, proceed with the following: cover affected area securely with sterile, dry, loose-fitting dressing. Treat symptomatically and supportively. Get medical attention immediately.

EYE CONTACT: Flush eyes immediately with large amounts of water or normal saline solution, occasionally lifting upper and lower lids until no evidence of product remains (approximately 15-20 minutes). Cover with sterile bandages. Get medical attention immediately.

TETRA Micronutrients**Material Safety Data Sheet**

This MSDS complies with the style format specified by ANSI Z400.1 - 1993

INGESTION: Dilute the product immediately with large amounts of water or milk and remove by gastric lavage unless the victim is already vomiting (Dreisbach, Handbook of Poisoning, 12th Ed.). Administration of gastric lavage should be performed by qualified medical personnel. Get medical attention immediately. Treat symptomatically and supportively. If vomiting occurs, keep head lower than hips to prevent aspiration.

NOTE TO PHYSICIAN: Antidote: The antidote, for poisoning from zinc salts recommended, is from Dreisbach, Handbook of Poisoning, 12th Edition. However, the decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel.

SECTION 5: FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARD: Negligible fire and explosion hazard in dust form when exposed to heat or flame.

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, water spray or foam, as appropriate for surrounding material. For larger fires, use water spray, fog or regular foam (1996 North American Emergency Response Guidebook, RSPA P 5800.7, Guide Number 171).

FIREFIGHTING: Move product from fire area if you can without risk. Extinguish fire using agent suitable for type of surrounding fire and/or chemicals. Do not use water directly on material. Avoid breathing vapors; keep upwind. Dike area to prevent runoff and contamination of water sources.

HAZARDOUS COMBUSTION PRODUCTS: Thermal decomposition may include toxic and hazardous oxides of zinc and sulfur.

SECTION 6: ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL SPILL: Do not touch spilled material. Pick-up dry spills by scooping, shoveling or vacuuming and place into containers for reuse or disposal. Wear respirator, protective clothing and gloves. Keep unnecessary people away. Isolate hazard area and deny entry to avoid material dispersal. Wash thoroughly after handling. Use with adequate ventilation.



TETRA Micronutrients

Material Safety Data Sheet

This MSDS complies with the style format specified by ANSI Z400.1 - 1993

SECTION 7: HANDLING AND STORAGE

Avoid outdoor storage in open piles since run-off could contaminate streams and/or ground water. It is recommended that storage and transfers of this product be done on an impervious surface which can be readily swept. Material should be properly stored outdoors prevent particles from becoming airborne.

Observe all federal, state and local regulations when storing this product.

SECTION 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS: No occupational exposure limits established by OSHA/ACGIH/NIOSH.

VENTILATION: Provide local exhaust or process enclosure ventilation.

EYE PROTECTION: Wear safety glasses with splash shields or safety goggles/shield to prevent contact with this product.

EMERGENCY WASH FACILITIES: Where there is any possibility that an employee's eyes and/or skin may be exposed to this product, the employer should provide an eye wash fountain and quick drench shower within the immediate work area for emergency use.

CLOTHING: Wear appropriate protective clothing and equipment to prevent repeated or prolonged skin contact with this product. Although skin contamination is not generally a problem, it increases the possibility of ingestion through poor personnel hygiene. Contaminated work clothing and shoes should not be taken from the workplace.

GLOVES: Wear appropriate protective gloves to prevent contact with this product.

TETRA Micronutrients

Material Safety Data Sheet

This MSDS complies with the style format specified by ANSI Z400.1 - 1993

RESPIRATOR: The respirator selected must be based on contamination levels found in the work place and specific to the job assignment. Do not exceed the working limits of the respirator. Respirators must also be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

- Any dust and mist respirator with a full facepiece;
- Any air-purifying full facepiece respirator with a high-efficiency particulate filter;
- Any powered air-purifying respirator with a tight-fitting facepiece and high-efficiency particulate filter;
- Any type "C" supplied-air respirator with a full facepiece operated in a pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in continuous-flow mode;
- Any self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.
- Escape-any air-purifying, full facepiece respirator with a high-efficiency particulate filter or any appropriate escape-type, self-contained breathing apparatus.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS: Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

DESCRIPTION: White, free-flowing powder

MOLECULAR FORMULA: $ZnSO_4 \cdot H_2O$

MOLECULAR WEIGHT: 179.46

pH: 5.0 @ 10% solution

MELTING POINT: Decomposes above 500°C (932°F)

BOILING POINT: Not applicable

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

WATER SOLUBILITY: 50% by weight

SOLVENT SOLUBILITY: Insoluble in alcohol

SPECIFIC GRAVITY: 3.28

SECTION 10: STABILITY AND REACTIVITY

TETRA Micronutrients

Material Safety Data Sheet

This MSDS complies with the style format specified by ANSI Z400.1 - 1993

REACTIVITY: Stable under normal temperatures and pressures.

CONDITIONS TO AVOID: May burn but does not ignite readily. Avoid contact with strong oxidizers and/or excessive heat. Do not allow spilled material to contaminate water sources.

INCOMPATIBILITIES:

Oxidizers (Strong): Fire and explosion hazard.

HAZARDOUS DECOMPOSITION: Thermal decomposition products may include toxic and hazardous oxides of zinc and sulfur.

POLYMERIZATION: Has not been reported to occur under normal temperatures and pressures.

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicological information for Zinc Sulfate Monohydrate is not available.

Toxicological information cited below is for specific Zinc Sulfate species.

TOXICITY DATA:

Anhydrous:

TD_{LO}: 45 mg/kg, oral, 7 days continuous, human

TD_{LO}: 106 mg/kg, oral, human

TD_{LO}: 180 mg/kg, oral, 6 weeks intermittent, man

TD_{LO}: 3120 mg/kg, oral, 43 weeks intermittent, woman

Dihydrate:

LD₅₀: 1710 mg/kg, oral, rat

LD₅₀: 926 mg/kg, oral, mouse

Heptahydrate:

LD₅₀: 2150 mg/kg, oral, rat

LD₅₀: 2200 mg/kg, oral mouse

LD_{LO}: 1914 mg/kg, oral, rabbit

TD_{LO}: 226,226 mg/kg, oral, 13 weeks continuous, rat

LD_{LO}: 221 mg/kg, unreported, man

CARCINOGEN STATUS: Data not available

LOCAL EFFECTS: Corrosive-inhalation, skin, eye, ingestion

ACUTE TOXICITY LEVEL: Moderately toxic by ingestion

TARGET EFFECTS: Poisoning may affect the liver and kidneys

HEALTH EFFECTS:

TETRA Micronutrients

Material Safety Data Sheet

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INHALATION (Zinc Sulfate):

Acute Exposure: Inhalation of dust may cause irritation of the respiratory tract with sore throat, coughing, shortness of breath, labored breathing, pain in the nose, mouth, and throat, and burns of the mucous membranes. If sufficient quantities are inhaled, pulmonary edema may develop, often with a latent period of 5 - 72 hours. The symptoms may include tightness in the chest, dyspnea, frothy sputum, cyanosis, and dizziness. Physical findings may include weak, rapid pulse, hypotension, hemoconcentration, and moist rales.

Chronic Exposure: Depending on the concentration and duration of exposure, repeated or prolonged exposure may cause inflammatory and ulcerative changes in the mouth and possibly bronchial and gastrointestinal disturbances.

SKIN CONTACT (Zinc Sulfate):

Acute Exposure: Direct contact may cause severe irritation, redness, pain, and possibly burns.

Chronic Exposure: Effects depend on concentration and duration of exposure. Repeated or prolonged contact with metal salts may result in dermatitis with erythematous, papular, and granulomatous reactions in susceptible individuals or effects similar to acute exposure.

EYE CONTACT (Zinc Sulfate):

Acute Exposure: Direct contact may cause severe irritation, redness, pain, blurred vision, and burns, possibly severe. The degree of injury depends on the concentration and duration of contact. The full extent of the injury may not be immediately apparent. Application of a 20% zinc sulfate solution to corneas infected with herpetic keratitis ulcers resulted in edema and residual scarring upon healing.

Chronic Exposure: Effects depend on concentration and duration of exposure. Repeated or prolonged contact may result in conjunctivitis or effects as in acute exposure.

INGESTION (Zinc Sulfate):

Acute Exposure: Ingestion may cause a burning pain in the mouth and throat, fever, nausea, violent vomiting with severe abdominal pain, watery or bloody diarrhea, prostration, tenesmus, retching, hyperglycemia, anuria, liver damage, kidney damage with albuminuria, acetonuria, and glycosuria, hypotension, sudden collapse, and convulsions.

Chronic Exposure: Depending on the concentration, repeated ingestion may cause effects as with acute ingestion. Prolonged ingestion of 33,000 mg/kg in drinking water resulted in severe anemia in mice. Reproductive effects have been reported in animals (anhydrous).

SECTION 12: ECOLOGICAL INFORMATION

ENVIRONMENTAL IMPACT RATING (0-4): No data available

ACUTE AQUATIC TOXICITY: No data available

DEGRADABILITY: No data available

LOG BIOCONCENTRATION FACTOR (BCF): No data available



TETRA Micronutrients

Material Safety Data Sheet

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LOG OCTANOL/WATER PARTITION COEFFICIENT: No data available

SECTION 13: DISPOSAL INFORMATION

Observe all federal, state and local regulations when disposing of this product.

SECTION 14: TRANSPORT INFORMATION

DOT Shipping Name: Environmentally hazardous substances, solid, n.o.s. (Zinc Sulfate Monohydrate), class 9, UN 3077, PG III, RQ

DOT Hazard Class or Division: 9

DOT Identification Number: UN 3077

DOT Packing Group: III

DOT Reportable Quantity: 1000 lb/454 kg

DOT Labeling Requirements: Class 9

DOT Packaging Authorizations: Refer to

Exceptions: 49 CFR 173.115

Non-Bulk Packaging: 49 CFR 173.213

Bulk Packaging: 49 CFR 173.240

SECTION 15: REGULATORY INFORMATION

	TSCA STATUS:	No
40 CFR 302.4	CERCLA SECTION 103:	No
40 CFR 355.30	SARA SECTION 302:	No
40 CFR 355.40	SARA SECTION 304:	No
40 CFR 372.65	SARA SECTION 313:	No
29 CFR 1910.119	OSHA Process Safety:	No



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40 CFR 370.21	California Proposition 65: SARA HAZARD CATEGORIES, SARA SECTIONS 311/312	No
	ACUTE HAZARD:	Yes
	CHRONIC HAZARD:	No
	FIRE HAZARD:	No
	REACTIVITY HAZARD:	No
	SUDDEN RELEASE HAZARD:	No



TETRA Micronutrients

Material Safety Data Sheet

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SECTION 16: OTHER INFORMATION

Individuals handling this product should be informed of the recommended safety precautions and should have access to this information.

This information relates to the specific product designated and may not be valid for such product used in combination with any other materials or in any other processes. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability, or completeness. It is the user's responsibility to satisfy themselves as to the suitability and completeness of such information for their own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

TETRA Micronutrients reserves the right to refuse shipment of this product to any consumer who fails to demonstrate the ability to consistently handle and use it safely and in compliance with all applicable laws, rules and regulations. Such demonstration may require on-site inspection of any or all storage, processing, packaging and other handling systems that come in contact with it.

Customers are responsible for compliance with local, state and federal regulations that may be pertinent in the storage, application and disposal of this product.