Safety Data Sheet

Section 01 - Product And Company Identification

Product Identifier	Copper Sulfate Pentahydrate
Other Means of Identification	Cupric sulfate, Bluestone, Blue Vitrol
Product Use and Restrictions on Use	Industrial manufacturing, algaecide, fungicide, herbicide, pesticide, animal feed additive.
Initial Supplier Identifier	ClearTech Industries Inc. 1500 Quebec Avenue Saskatoon, SK. Canada S7K 1V7
Prepared By	ClearTech Industries Inc. Technical Writer Phone: 1 (800) 387-7503
24-Hour Emergency Phone	Phone: 1 (306) 664 – 2522

Section 02 - Hazard Identification

GHS-Classification

Acute Toxicity-Oral	Category 4
Acute Toxicity-Dermal	Category 4
Aquatic Toxicity-Acute	Category 1
Aquatic Toxicity-Chronic	Category 1

Physical Hazards

No known physical hazards.

Warning

Hazards Statements

H302 – Harmful if swallowed.
H312 – Harmful in contact with skin.
H400 – Very toxic to aquatic life.
H410 – Very toxic to aquatic life with long lasting effects.

Pictograms

Precautionary Statements
P270 – Do not eat, drink or smoke when using this product.
P301 + P312 – IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330 – Rinse mouth.
P280 – Wear protective gloves, protective clothing, eye protection, and face protection.
P302 + P352 – IF ON SKIN: Wash with plenty of soap and water.
P312 – Call a POISON CENTER or doctor/physician if you feel unwell.
P273 – Avoid release to the environment.
P391 – Collect spillage.
P501 – Dispose of contents/container in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 03 - Composition / Information on Ingredients

Chemical Name	CAS Number	Weight %	Unique Identifiers
Copper Sulfate Pentahydrate	7758-99-8	100%	

Section 04 - First Aid Measures

Inhalation
If symptoms are experienced, remove victim to fresh air. Give artificial respiration only if breathing has stopped. If breathing is difficult, give oxygen. Seek medical attention.

Skin Contact / Absorption
Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention if irritation occurs or persists.

Eye Contact
Contact lenses should never be worn when working with this product. Flush immediately with water for at least 30 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. If irritation persists, seek medical attention.

Ingestion
IF SWALLOWED: Call a POISON CENTER or doctor/physician immediately. Rinse mouth. Do NOT induce vomiting. Promptly drink large quantities of milk, egg white, gelatin solution, or if these are not available, drink large quantities of water. Never give anything by mouth to an unconscious person. Avoid alcohol.

Additional Information
Note to Physicians:
Treat symptomatically. Material may be corrosive. Possible mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be necessary. Wilson's disease can be aggravated by excessive exposure. Symptoms include nausea, vomiting, epigastria pain, diarrhea, jaundice, and general debility.

Section 05 - Fire Fighting Measures

Suitable Extinguishing Media
Use extinguishing media suitable for surrounding fire. Use water spray to known down acidic gases such as sulfur dioxide or sulfur trioxide.

Unsuitable Extinguishing Media
Not Available

Specific Hazards Arising From the Chemical
Under fire conditions or when heated, copper (II) sulfate may release very toxic and corrosive sulfur dioxide and sulfur trioxide; copper and cupric oxide fumes, and cupric hydroxide. When exposed to heat from a fire, the hydrated forms of copper (II) sulfate will rapidly build-up pressure inside containers. Explosive rupture and a sudden release of large amounts of hot steam and molten solid may occur.

Special Protective Equipment and Precautions for Fire-Fighters
Wear NIOSH-approved self-contained breathing apparatus and protective clothing.

Further Information
Not Available

Section 06 - Accidental Release Measures

Personal Precautions / Protective Equipment / Emergency Procedures	Wear appropriate personal protective equipment. Ventilate area. Only enter area with PPE. Stop or reduce leak if safe to do so. Flush with water to remove any residue.
Environmental Precautions	Prevent run off to storm sewers and ditches leading to natural waterways.
Methods and Materials for Containment and Cleaning Up	Prevent further leakage or spillage if safe to do so. Avoid the generation of dusts during clean-up. Wear NIOSH or MSHA approved respirator if dust will be generated. Dry sweep up, using a sweeping compound. Shovel spilled material into plastic bags and seal with tape. Place in appropriate containers for disposal. Dispose of contents/container to an approved waste disposal plant.

Section 07 - Handling and Storage

Precautions for Safe Handling	Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.
Conditions for Safe Storage	Store in a cool, dry, well-ventilated place. Keep container tightly closed and away from incompatible materials. Storage materials compatible for copper sulfate include stainless steel [304, 347 or 316], rubber, fiberglass, polypropylene, PVC or other plastic material. Keep away from galvanized piping and nylon material. Place any damaged containers in plastic bags. Iron and moisture should be avoided. With exposure to air it will oxidize and turn whitish.
Incompatibilities	Aluminum powders. Acetylene. Hydroxylamine. Magnesium. Moisture. Contact with magnesium can generate dangerous levels of hydrogen gas.

Section 08 - Exposure Controls and Personal Protection

Exposure Limit(s)

Component	Regulation	Type of Listing	Value
Copper Sulfate Pentahydrate	ACGIH	TWA	1mg/m^3
	OSHA	PEL-T-TWA	1 mg/m^3

Engineering Control(s)

Ventilation Requirements	Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions must be provided in accordance with all fire codes and regulatory requirements. Supply sufficient replacement air to make up for air removed by exhaust systems.
Other	Emergency shower and eyewash must be available and tested in accordance with regulations and be in close proximity.

Protective Equipment

Eyes/Face	Chemical safety glasses with side shields should be worn while product is being handled.
Hand Protection	Impervious gloves of chemically resistant material (rubber or PVC) should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse.
Skin and Body Protection	Body suite, aprons, and/or coveralls of chemical resistant material should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse. Impervious boots of chemically resistant material should be worn at all times. No special footwear is required other than what is mandated at place of work.

Respiratory Protection	NIOSH/OSHA RECOMMENDATIONS FOR COPPER DUSTS/MISTS CONCENTRATIONS IN AIR: Up to 5mg/m^3: Any quarter-mask respiratory. Up to 10mg/m^3: Any particulate respiratory equipped with an N95, R95, OR P95 filter except quarter-mask respirators. The following filters may also be used: N99, R99, N100, R100, OR P100 filter. Any powered, air-purifying respirator with a tight-fitting face piece and a high-efficiency particulate filter. Any self-contained breathing apparatus with a full face piece. Any supplied-air respiratory with a full face piece. Up to 50mg/m^3: Any air-purifying, full-face piece respiratory with an N100, R100, OR P100 filter. Any powered, air-purifying respirator with a tight-fitting face piece and a high-efficiency particulate filter. Any self-contained breathing apparatus with a full face piece. Any supplied-air respiratory with a full face piece. Up to 100mg/m^3: Any supplied-air respirator that has a full face piece and is operated in a pressure-demand or other positive-pressure mode.
Thermal Hazards	Not Available

Section 09 - Physical and Chemical Properties

Appearance

Physical State	Solid crystals, granules or powder
Colour	Transparent blue
Odour	Odourless
Odour Threshold	Not Available

Property

pH	3.9 (10% solution)
Melting Point/Freezing Point	110°C (230°F)
Initial Boiling Point and Boiling Range	150°C (302°F)
Flash Point	Not Applicable
Evaporation Rate	Not Applicable
Flammability	Non-Flammable
Upper Flammable Limit	Not Applicable
Lower Flammable Limit	Not Applicable
Vapour Pressure (mm Hg, 20^{o}C)	Not Applicable
Vapour Density (Air=1)	Not Applicable
Relative Density	Not Available
Solubility(ies)	Soluble in water (22g/100mL) @ 25°C Soluble in methanol, glycerol and insoluble in ethanol.
Partition Coefficient: n-octanol/water	Not Applicable

Auto-ignition Temperature	Not Applicable
Decomposition Temperature	88°C
Viscosity	Not Applicable
Explosive Properties	Not Available
Specific Gravity (Water=1)	2.29
% Volatiles by Volume	Not Available
Formula	$CuSO_4 \cdot 5H_2O$
Molecular Weight	249.67

Section 10 - Stability and Reactivity

Reactivity	Not Available
Stability	Stable under recommended storage conditions.
Possibility of Hazardous Reactions	None using normal processing. Does not react with water.
Conditions to Avoid	Keep out of reach of children. Solutions are mildly corrosive to steel. Store in plastic or rubber or 304, 347 or 316 stainless steel.
Incompatible Materials	Not Available
Hazardous Decomposition Products	Some possible thermal decomposition products are very toxic and corrosive sulfur dioxide and sulfur trioxide, cupric hydroxide sulfate, cupric hydroxide, and cupric oxide.

Section 11 - Toxicological Information

Acute Toxicity

Component	Oral LD_{50}	Dermal LD_{50}	Inhalation LC_{50}
Copper Sulfate Pentahydrate	300mg/kg (rat)	>1000mg/kg (rabbit)	Not Available

Chronic Toxicity – Carcinogenicity

Component	IARC
Copper Sulfate	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Skin Corrosion/Irritation	May cause severe skin irritation, itching of skin and localized discoloration of the skin. Can cause allergic contact dermatitis.
Ingestion	Ingestion may result in gastritis, nausea, vomiting, diarrhea and ulceration of the gastrointestinal tract. Severe poisoning or death may result from ingesting large doses.
Inhalation	Inhalation may cause irritation of the respiratory tract. Excessive inhalation may also cause ulceration and nasal septum perforation.
Serious Eye Damage/Irritation	May cause eye irritation.
Respiratory or Skin Sensitization	Repeated contact may cause sensitization in some individuals.
Germ Cell Mutagenicity	Not Available
Reproductive Toxicity	Not Available

STOT-Single Exposure	Not Available
STOT-Repeated Exposure	Severe exposure or chronic exposure by ingestion or inhalation of copper sulphate may induce severe gastroenteric distress (vomiting, gastroenteric pain, local corrosion, and hemorrhages), a metallic taste in the mouth, prostration, anuria, hematuria, anemia, an increase in white blood cells, coma, respiration difficulties, and circulatory problems. May cause liver and kidney damage.
Aspiration Hazard	Not Available
Synergistic Materials	Not Available

Section 12 – Ecological Information

Ecotoxicity

Component	Toxicity to Algae	Toxicity to Fish	Toxicity to Daphnia and Other Aquatic Invertebrates
Copper Sulfate Pentahydrate	Not Available	LC_{50} (Salmo gairdneri): 0.0.135mg/L LC_{50} (pimpephales promelas): 0.838mg/L	LC_{50} (Shrimp, 96hr):16.9mg/L

Biodegradability	Not Available
Bioaccumulation	Bioaccumulation of this chemical may occur along the food chain, for example in fish.
Mobility	Not Available
Other Adverse Effects	In soil, copper can be particularly toxic to invertebrates and phytotoxic to plants at elevated concentrations with soil properties being regulating factors.

Section 13 – Disposal Considerations

Waste From Residues/Unused Products	Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.
Contaminated Packaging	Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 – Transport Information

UN Number	UN 3077
UN Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (Copper Sulfate Pentahydrate)
Transport Hazard Class(es)	9
Packaging Group	III
Environmental Hazards	Listed as a marine pollutant under Canadian TDG Regulations, schedule III.
Special Precautions	Not Available
Transport in Bulk	Not Available

Additional Information

Packing Group	Limited Quantity Index
III	5 Kg

TDG

Other	Secure containers (full and/or empty) with suitable hold down devises during shipment and ensure all caps, valves, or closures are secured in the closed position.

TDG PRODUCT CLASSIFICATION: This product has been classified on the preparation date specified at section 14 of this MSDS / SDS, for transportation in accordance with the requirements of part 2 of the Transportation of Dangerous Goods Regulations. If applicable, testing and/or published test data regarding the classification of this product are listed in the references at section 16 of this MSDS / SDS.

Section 15 – Regulatory Information

NOTE: THE PRODUCT LISTED ON THIS SDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS SDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

Section 16 – Other Information

Preparation Date August 24, 2015

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

Attention: Receiver of the chemical goods / SDS coordinator

As part of our commitment to the Canadian Association of Chemical Distributors (CACD) Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service center.

References:

1) CHEMINFO
2) eChemPortal
3) TOXNET
4) Transportation of Dangerous Goods Canada
5) HSDB
6) ECHA

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