Safety Data Sheet

Material Name: Copper Sulfate Pentahydrate ID: C1-121A

* * * Section 1 - Identification * * *

Chemical Name: Copper Sulfate Pentahydrate
Product Use: Specific applications are listed on the label for the product.

RESTRICTIONS on USE

SPECIFIC RESTRICTIONS ARE LISTED ON THE LABEL FOR THE PRODUCT

Supplier Information
Chem One Ltd.
14140 Westfair East Drive
Houston, Texas 77041-1104

Phone: (713) 896-9966
Fax: (713) 896-7540
Emergency # (800) 424-9300 or +1- (703) 527-3887

General Comments

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

* * * Section 2 – Hazard(s) Identification * * *

GHS HAZARD

Hazard Classes	Hazard Categories
Acute toxicity, Oral	Category 4
Serious eye damage/irritation	Category 1
Acute aquatic toxicity	Category 1
Chronic aquatic toxicity	Category 1

Signal Word: Danger

Pictograms:

Hazard Statements

PHYSICAL HAZARDS: None

HEALTH HAZARDS: H302: Harmful if swallowed.
H319: Causes serious eye irritation

ENVIRONMENTAL HAZARDS: H410: Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS:
P102: Keep out of reach of children
P202: Do not handle until all safety precautions have been read and understood
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.

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P273: Avoid release to the environment
P280: Wear eye protection/face protection/protective gloves.

RESPONSE STATEMENTS:

P301+P312+P330: IF SWALLOWED: Call a POISON CENTER /doctor if you feel unwell (USA National POISON CENTER 800-222-1222). Rinse mouth.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER/doctor (USA NATIONAL POISON CENTER 800-222-1222)
P391: Collect spillage

STORAGE STATEMENTS: None

DISPOSAL STATEMENTS: P501: Dispose of content and/or container in accordance with local, regional, national or international regulations

Hazards not otherwise classified (HNOC): No data available

* * * Section 3 – Composition/information on Ingredients * * *

CAS #	Component	Percent
7758-99-8	Copper (II) Sulfate Pentahydrate	> 99%

Synonyms: Copper Sulfate Crystals, Blue Copper, Blue Stone, Blue Vitriol, Copper (II) sulfate, Cupric Sulfate, Copper Sulfate Fine 200, Fine 100, Fine 30, 20, 25, Small, Medium, Large, FCC IV, and Very High Purity

* * * Section 4 – First Aid Measures * * *

Emergency Overview

Copper Sulfate Monohydrate is a blue, odorless, crystalline solid or powder. Potentially fatal if swallowed. May cause irritation to the eyes, respiratory system and skin. Fire may produce irritating, corrosive and/or toxic fumes. This material is classified as a severe marine pollutant and should not be released into the environment. Firefighters should use full protective equipment and clothing.

Description of first aid measures:

In case of eye contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor.

In case of skin contact: Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

In case of ingestion: DO NOT INDUCE VOMITING. Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

If inhaled: Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

Symptoms and potential health effects:

Eyes: Causes serious eye damage. Signs/symptoms may include cloudy appearance of the cornea, chemical burns, severe pain, tearing, ulcerations, significantly impaired vision or complete loss of vision.

Skin: This product may cause irritation of the skin with pain, itching and redness. Severe overexposure can cause skin burns. Prolonged exposure may cause dermatitis and eczema.

Ingestion: Harmful or fatal if swallowed. May cause gastrointestinal irritation with symptoms such as nausea, vomiting, and diarrhea. Ingestion may cause degeneration of liver, kidney, or renal failure. Persons who survive ingestion may develop granulomatous lesions of the kidney. Ingestion of large amounts may lead to convulsions, coma or death.

Inhalation: May irritate the nose, throat and respiratory tract. Symptoms can include sore throat, coughing and shortness of breath. In severe cases, ulceration and perforation of the nasal septum can occur. If this material is heated, inhalation of fumes may lead to development of metal fume fever. This is a flu-like illness with symptoms of metallic taste, fever and chills, aches, chest tightness and cough. Repeated inhalation exposure can cause shrinking of the lining of the inner nose.

Notes to Physician and Special Treatment

Provide general supportive measures and treat symptomatically. Basic Treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by non-rebreather mask at 10 to 15 L/minutes. Monitor for shock and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. Do not use emetics. For ingestion, rinse mouth and administer 5 mL/kg up to 200 mL of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal. Advanced Treatment: Consider orotracheal or nontracheal intubation for airway control in the patient who is unconscious. Start an IV with lactated Ringer's SRP: "To keep open", minimal flow rate. Watch for signs of fluid overload. For hypotension with signs of hypovolemia, administer fluid cautiously. Consider vasopressors if hypotensive with a normal fluid volume. Watch for signs of fluid overload. Use proparacaine, hydrochloride to assist eye irrigation.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

Copper Sulfate Pentahydrate is not combustible, but may decompose in the heat of a fire to produce corrosive and/ or toxic fumes.

Hazardous Combustion Products

Sulfur oxides and copper fumes.

Extinguishing Media

Use methods for surrounding fire.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self-contained breathing apparatus. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.

NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0 Other:

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Personal precautions

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials, which can burn away from spilled material. In case of large spills, follow all facility emergency response procedures. Wear appropriate protective equipment and clothing during cleanup. Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

Methods and materials for containment and clean-up

Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product. Shovel the material into waste container. Thoroughly wash the area after a spill or leak cleanup

Environmental precautions

Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling, when used as a pesticide. Do not breathe dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling

Storage Procedures

Keep in original container in locked storage area. Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Storage areas should be made of fire-resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. Floors should be sealed to prevent absorption of this material. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers). Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Do not cut, grind, weld, or drill near this container. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Do not store this material in open or unlabeled containers. Limit quantity of material stored. Store in suitable containers that are corrosion-resistant.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Exposure Guidelines

A: General Product Information

Follow the applicable exposure limits.

B: Component Exposure Limits

The exposure limits given are for Copper & inorganic Compounds, as Cu (7440-50-8), Copper fume as Cu or Copper dusts and mists, as Cu.

Component	CAS #	Value	Type/Regulation
Copper, dusts and mists (as Cu)	7440-50-8	1 mg/m³	ACGIH – TWA
		1 mg/m³	NIOSH – TWA
		1 mg/m³	OSHA – TWA
Copper, fume, respirable fraction (as Cu)	7440-50-8	0.2 mg/m³	ACGIH – TWA
		0.1 mg/m³	NIOSH – TWA
		0.1 mg/m³	OSHA – TWA

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Copper (7440-50-8) and inorganic compounds, as Cu, Copper (7440-50-8) dusts and mists, as Cu and Copper fume, Cu.

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.

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields (or goggles) and a face shield, if this material is made into solution. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin

Wear impervious gloves, boots and coveralls to avoid skin contact. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory

If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. The following NIOSH Guidelines for Copper dust and mists (as Cu) are presented for further information.

Up to 5 mg/m^3: Dust and mist respirator.
Up to 10 mg/m^3: Any dust and mist respirator except single-use and quarter mask respirators or any SAR.
Up to 25 mg/m^3: SAR operated in a continuous-flow mode or powered air-purifying respirator with a dust and mist filter(s).
Up to 50 mg/m^3: Air purifying, full-facepiece respirator with high-efficiency particulate filter(s), any powered air-purifying respirator with tight-fitting facepiece and high-efficiency particulate filter(s) or full-facepiece SCBA, or full-facepiece SAR.
Up to 100 mg/m^3: Positive pressure, full-facepiece SAR.
Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full-facepiece SCBA, or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.
Escape: Full-facepiece respirator with high-efficiency particulate filter(s), or escape-type SCBA.
NOTE: The IDLH concentration for Copper dusts and mists (as Cu) is 100 mg/m^3.

Personal Protective Equipment: General

Wash hands thoroughly after handling material. Do not eat, drink or smoke in work areas. Have a safety shower or eye-wash fountain available. Use good hygiene practices when handling this material including changing and laundering work clothing after use. Discard contaminated shoes and leather goods

Protective Clothing Pictograms

* * * Section 9 - Physical & Chemical Properties * * *

Physical Properties:

Physical State:	Solid
Appearance:	Blue crystals or powder
Odor:	Odorless
Odor Threshold:	Not determined
pH:	3.7 – 4.4 (10% solution)
Melting Point/Range:	150 °C (302 °F)
Boiling Point/Range:	Not applicable
Flash Point:	Not applicable
Evaporation Rate:	Not applicable
Flammability:	Not flammable
Flammability/Explosive Limits:	Not applicable
Vapor Pressure:	Nil
Vapor Density:	Not applicable
Specific Gravity:	2.28
Solubility in Water:	31.6 g/100 cc (20 °C)
Partition Coefficient:	Not determined
Autoignition Temperature:	Not determined
Decomposition Temperature:	560 °C (1040 °F)
Viscosity:	Not applicable
Chemical Formula:	$CuSO_4 * 5(H_2O)$
Molecular Weight:	249.68

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Softening Point:	Not determined
Particle Size:	Varies
Bulk Density:	Not determined
Heat of Combustion:	Not determined

Additional Information
The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability
Copper Sulfate Pentahydrate is hygroscopic, but stable when kept dry, under normal temperature and pressures.

Conditions to Avoid
Avoid high temperatures, exposure to air and incompatible materials.

Incompatibility
Copper Sulfate causes hydroxylamine to ignite and the hydrated salt is vigorously reduced. Solutions of sodium hypobromite are decomposed by powerful catalytic action of cupric ions, even as impurities. Copper salts, including Copper Sulfate may react to form explosive acetylides when in contact with acetylene or nitromethane. Contact with reducing agents, can cause a vigorous reaction, especially in solution. This product can corrode aluminum, steel and iron. Copper Sulfate Monohydrate is incompatible with magnesium, strong bases, alkalines, phosphates, acetylene, hydrazine, and zirconium.

Hazardous Decomposition
Sulfur oxides and Copper oxides.

Hazardous Polymerization Will not occur.

* * * Section 11 - Toxicological Information * * *

Acute and Chronic Toxicity

A: General Product Information
Acute toxicity is largely due to the corrosive (acidic) properties of this material. Harmful or fatal if swallowed. Product is an eye and skin irritant, and may cause burns. Product is a respiratory tract irritant, and inhalation may cause nose irritation, sore throat, coughing, and chest tightness and possibly, ulceration and perforation of the nasal septum.
Chronic: Long term skin overexposure to this product may lead to dermatitis and eczema. Prolonged or repeated eye contact may cause conjunctivitis and possibly corneal abnormalities. Chronic overexposure to this product may cause liver and kidney damage, anemia and other blood cell abnormalities.

B: Component Analysis
Copper Sulfate Monohydrate (7758-99-8)

Route of Exposure	Test Type and Value
Oral:	LD_{50} (rat) = 330 mg/kg LD_{50} (mouse) = 369 mg/kg LD_{Lo} (man) = 857 mg/kg LD_{Lo} (human) = 50 mg/kg: Behavioral: somnolence; Kidney, urethra, bladder: changes in tubules; Blood: hemorrhage TD_{Lo} (human) = 11 mg/kg: Gastrointestinal: gastritis; Gastrointestinal: hypermotility, diarrhea, nausea, or vomiting TD_{Lo} (woman) = 2400 mg/kg/d; Gastrointestinal tract effects TD_{Lo} (woman) = 100 mg/kg: Vascular: Blood pressure lowering not characterized in autonomic section; Liver: hepatitis, diffuse; Kidney, Urethra, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis) TD_{Lo} (human) = 143 mg/kg: Pulmonary system effects, Gastrointestinal effects TD_{Lo} (rat, 6 w) = 157 mg/kg: Endocrine: changes in adrenal weight; weight loss

	or decreased weight gain; enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases TD_{Lo} (rat, 30 d) = 7530 mg/kg: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Blood: changes in erythrocyte (RBC) count; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: - multiple enzyme effect TD_{Lo} (rat, 20 d) = 2 g/kg: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases, Enzyme inhibition, induction, or change in blood or tissue levels TD_{Lo} (rat, 1 y) = 915 mg/kg: Cardiac: changes in coronary arteries; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol) TD_{Lo} (mouse, 8 w) = 3 g/kg: Blood: changes in spleen; Immunological Including Allergic: decrease in cellular immune response, decrease in humoral immune response TD_{Lo} (mouse, 3 w) = 2 g/kg: Blood: changes in spleen; Immunological Including Allergic: decrease in cellular immune response, decrease in humoral immune response LD_{Lo} (dog, adult) = 60 mg/kg LD_{Lo} (pigeon) = 1000 mg/kg LD_{Lo} (sheep) = 5 mg/kg LD_{Lo} (wild bird) = 300 mg/kg
Inhalation:	Not determined
Dermal:	LD_{50} (rat, subcutaneous) = 43 mg/kg TD_{Lo} (rat, male, subcutaneous, 1 d pre-mating) = 12768 µg/kg: Reproductive: Paternal effects: testes, epididymis, sperm duct LD_{Lo} (mouse, subcutaneous) = 500 µg/kg TD_{Lo} (mouse, subcutaneous, 30 d pre-mating) = 12768 µg/kg: Reproductive: Paternal Effects: testes, epididymis, sperm duct LD_{Lo} (guinea pig, subcutaneous, adult) = 62 mg/kg
Intraperitoneal:	LD_{50} (rat) = 18700 mg/kg LD_{50} (mouse) = 33 mg/kg
Intravenous:	LD_{50} (rat) = 48900 µg/kg LD_{50} (mouse) = 23300 µg/kg TD_{Lo} (rat, 18 w) = 791 mg/kg: Nutritional and Gross Metabolic: weight loss or decreased weight gain TD_{Lo} (rat, female, 3 d after conception) = 7500 µg: Reproductive: Fertility: other measures of fertility TD_{Lo} (mouse, female, 8 d after conception) = 3200 µg/kg: Reproductive: Effects on embryo or fetus: fetotoxicity; Specific developmental abnormalities: central nervous system, cardiovascular system TD_{Lo} (mouse, female, 7 d after conception) = 3200 µg/kg: Reproductive: Fertility: post-implantation mortality TD_{Lo} (guinea pig) = 2 mg/kg LD_{Lo} (frog) = 25 mg/kg
Intratesticular:	TD_{Lo} (rat, 1 d pre-mating) = 3192 µg/kg: Reproductive: Paternal effects: spermatogenesis, testes, epididymis, sperm duct

Carcinogenicity

A: General Product Information

Copper Sulfate Pentahydrate (7758-99-8)

Cytogenetic Analysis-Rat/ast 300 mg/kg

B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

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Mutagenicity

Human and animal mutation data are available for Copper Sulfate Pentahydrate; these data were obtained during clinical studies on specific human and animal tissues exposed to high doses of this compound.

Teratogenicity

There are no reports of teratogenicity in humans. Animal studies indicate that a deficiency or excess of copper in the body can cause significant harm to developing embryos. The net absorption of copper is limited and toxic levels are unlikely from industrial exposure.

Other Toxicological Information

Individuals with Wilson's disease are unable to metabolize copper. Thus, persons with pre-existing Wilson's disease may be more susceptible to the effects of overexposure to this product.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Harmful to aquatic life in very low concentrations. Copper Sulfate Pentahydrate is toxic to fish and marine organisms when applied to streams, rivers, ponds or lakes. If released to soil, copper sulfate may leach to groundwater, be partly oxidized or bind to humic materials, clay or hydrous oxides of iron and manganese. In water, it will bind to carbonates as well as humic materials, clay and hydrous oxides of iron and manganese. Copper is accumulated by plants and animals, but it does not appear to biomagnify from plants to animals. In air, copper aerosols have a residence time of 2 to 10 days in an unpolluted atmosphere and 0.1 to greater than 4 days in polluted, urban areas.

B: Ecotoxicity

Copper Sulfate Pentahydrate (7758-99-8)

Toxicity to fish:	LC_{50} (*Lepomis machochirus,* bluegill, static) = 884 mg/L
	LC_{50} (*Lepomis cyanellus,* Green sunfish, static) = 3510 µg/L
	LC_{50} (*Pimephales promelas,* Fathead minnow) = 838 µg/L
	LC_{50} (*Crassius auratus,* Goldfish) = 1380 µg/L
	LC_{50} (*Salmo gairdneri,* Rainbow trout, 48) = 0.14 ppm
	LC_{50} (Stripped bass, 96 h) = ≤1 ppm
Toxicity to invertebrates:	LC_{50} (*Daphnia magna*) = 0.182 mg/L
	LC_{50} (Prawn, 48 h) = 0.14 ppm
	LC_{50} (Shrimp, 96 h) = 17.0 ppm copper
	LC_{50} (Blue crab, 96 h) = 28 ppm copper
	LC_{50} (Oyster, 96 h) = 5.8 ppm copper
	LC_{50} (*Viviparus bengalensis*, snail, 96 h) = 0.060 ppm copper
Toxicity to algae:	Not determined
Toxicity to bacteria:	Not determined

Environmental Fate

No information available.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

A: General Product Information

This product is a registered pesticide.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

All wastes must be handled in accordance with local, state and federal regulations or with regulations of Canada and its Provinces. This material can be converted to a less hazardous material by weak reducing agents followed by neutralization. Do not reuse empty containers. Do not rinse unless required for recycling. If partly filled, call local solid waste agency for disposal instructions. Never pour unused product down drains or on the ground.

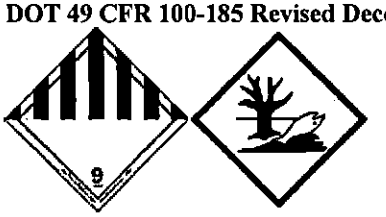
Pesticide Disposal

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticides, spray mixtures, or rinsate is a violation of U.S. Federal and Canadian Law. If these wastes cannot be disposed of by use, according to product label instruction, contact your U.S. State, or Canadian Province Pesticide or Environmental Control Agency, or the hazardous waste representative at the nearest U.S. EPA Regional Office, or the offices of Environment Canada for guidance.

* * * Section 14 – Transportation Information Ground * * *

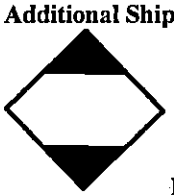
NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under 49 CFR, IATA and IMDG to assure regulatory compliance.

US DOT 49 CFR 100-185 Revised December 31, 2014 Information



UN/NA #: UN 3077
Shipping Name: Environmentally Hazardous Substance, solid, n.o.s. (cupric sulfate)
Hazard Class: 9
Packing Group: III
Required Label(s): Class 9
Special Provision: 8, 146, 335, A112, B54, IB8, IP2, N20, T1, TP33
Packaging: 172.155, 172.213
RQ Quantity: For a single package less than the RQ of 10lb (4.54 kg), the RQ designation should be not be used.
Marking: MARINE POLLUTANT Marine Pollutant when shipping ground greater than 882 pounds single container or any quantity by water

Additional Shipping Information



Limited Quantity Shipments: Shipments, except for air, need not be marked with the Proper Shipping Name and UN # of the contents, but shall be marked with a diamond. The top and bottom portions of the square-on-point must be black and the center white or of a suitable contrasting background. The mark must be at least 2 mm. Each side must have a minimum dimension of 100 mm. Small packages which cannot reasonably accommodate a 100 mm square-on-point mark may be marked with a square-on-point mark with a minimum side dimension of 50 mm. The total weight of each outer packaging cannot exceed 30 kg (66 pounds).

Small Quantities for Highway and Rail: The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle. The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement of the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet the drop test requirements of 173.4(6) (i). The outside of the package must be marked with the statement
"This package conforms to 49 CFR 173.4 for domestic highway or rail transport only."

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 1000 g (2.2 pounds). The inner receptacles must be securely

packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet a drop test. The requirements are found in 173.4(6) (i). The package must not be opened or otherwise altered until it is no longer in commerce. For highway or rail transportation no shipping paper is required. The package must be legibly marked with the following marking:

NOTE: The "*" must be replaced 173.4(6) (i). The package must not be opened or otherwise altered until it is no longer in commerce. For highway or rail transportation no shipping paper is required. The package must be legibly marked with the following marking:

NOTE: The "*" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The "***" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm (3.9 inches) x 100 mm (3.9 inches), and must be durable and clearly visible.

De minimis Exceptions: The maximum quantity of this material per inner receptacle is limited to 1g (0.04 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 100 g (0.22 pounds). The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet the drop test. The requirements are found in 173.4(6) (i). The package must not be opened or otherwise altered until it is no longer in commerce and may be transported by aircraft. If all of the above requirements are met, then this material is not regulated.

Please refer to the most recent edition of the "International Air Transport Association (IATA)" Regulations

Please refer to the most recent Amendment of the "International Maritime Dangerous Goods (IMDG) Code"

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

Copper Sulfate Pentahydrate (CAS # 7758-99-8) is listed as a Priority and Toxic Pollutant under the Clean Water Act.

B: Component Analysis This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

Copper Compounds (7440-50-8)

SARA 313: Final RQ = 5000 pounds (2270 kg) Note: No reporting of releases of this substance is required if the diameter of the pieces of the solid metal released is equal to or greater than 0.004 inches.

Cupric Sulfate (7758-98-7)

CERCLA: final RQ = 10 pounds (4.54 kg)

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Copper Sulfate Pentahydrate	7758-99-8	No	No	No	Yes	Yes

State Regulations

A: General Product Information

California Proposition 65

Copper Sulfate Pentahydrate is not on the California Proposition 65 chemical lists.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substance lists:

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Component	CAS #	CA	FL	MA	MN	NJ	PA
Copper	7440-50-8	Yes	No	Yes	No	Yes	Yes
Copper, fume, dust and mists	N/A	No	Yes	No	Yes	No	Yes
Copper Sulfate Pentahydrate	7758-99-8	No	No	No	No	Yes	Yes

Other Regulations

A: General Product Information

When used as a pesticide, the requirements of the U.S. Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), or requirements under the Canadian Pest Control Act, are applicable.

B: Component Analysis - Inventory

Component	CAS #	TSCA
Copper Sulfate Pentahydrate	7758-99-8	Exempted

Although this compound is not on the TSCA Inventory, it is accepted as a hydrate of a listed compound, Copper Sulfate (CAS # 7758-98-7), per 40 CFR 710.4 (d) (3) and 40 CFR 720.30 (h) (3). Under this section of TSCA, any chemical substance which is a hydrate of a listed compound is accepted.

* * * Section 16 - Other Information * * *

Other Information

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com.

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration

Contact: Safety@chemone.com **Contact Phone:** (713) 896-9966

Revision log

08/04/00 2:40 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.
05/31/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Ratings.
07/24/01 4:22 PM CLJ Add Shipments by Air information to Section 14, Contact changed to Sue, non-800 Chemtrec Num.
09/18/01 11:27 AM SEP added Domestic Transportation Exception, Sect 14
10/05/01 3:30 PM SEP Deleted Alternate Shipping Name, Sect 14
2/18/02 4:21 PM HDF Added more information on Marine Pollutant Markings and Limited Quantity Shipments
10/09/03: 2:02 pm HDF Addition of chronic health hazard information. Addition of inhalation hazard information, Section 3. Section 4 – expansion of information on Information for Physicians. Up-graded Section 10 Reactivity Information. Up-Dated entire Section 14 Transportation Information to include IATA, IMO transport information.
06/22/05 2:11 PM SEP Update IATA& IMO Section 14
01/06/2006 10:38 am SEP Corrected Section 14 DOT domestic transport exception to read 49 CFR 172.322 (d) (3).
09/05/06 2:52 PM SEP Updated DOT Section 14.
10/17/2006 11:45 am SEP Updated Section 11
10/17/07 4:10 PM SEP Update IATA Section 14
10/10/08 3:46 PM DLY Changed Chem One Physical Address, Section 1
09/18/09 MMK Updated Section 14 limited & excepted quantities and exceptions
1020/2105 GHS revision all sections

Safety Data Sheet

Material Name: Copper Sulfate Pentahydrate ID: C1-121A

Revised By:
SJC Compliance Education, Inc.
16516 El Camino Real Suite 417
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09/27/2018 Melanie Koch removed IMDG and IATA specific shipping information and added a refer to latest edition statement. And added NFPA section no other changes were made.
06/17/2019 Revised Sections 2, 4, 9 and 11, removed ANSI Labeling.
12/09/2021 Revised Section 15 information. Modified format.

This is the end of SDS # C1-121

CHEM ONE LIMITED