Material Safety Data Sheet
Material Name: Copper Chloride Dihydrate, or Cupric Chloride Dihydrate ID: C1-115

* * * Section 1 - Chemical Product and Company Identification * * *

Chemical Name: Copper Chloride Dihydrate or Cupric Chloride Dihydrate
Product Use: For Commercial Use
Synonyms: Copper (II) Chloride Dihydrate, Cupric Chloride Dihydrate
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 (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.
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 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
10125-13-0	Copper (II) Chloride, Dihydrate or Cupric (II) Chloride Dihydrate	> 98

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.
Component Information/Information on Non-Hazardous Components
This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

* * * Section 3 - Hazards Identification * * *

Emergency Overview
Copper Chloride Dihydrate is a blue-green solid in crystalline or powdered form. Harmful or fatal if swallowed. Corrosive to skin and respiratory tract. Can cause permanent damage to eyes. Fire may produce irritating, corrosive and/or toxic vapors. Firefighters should use full protective equipment and clothing.
Hazard Statements
CORROSIVE. CAUSES SKIN, EYE AND RESPIRATORY TRACT BURNS. HARMFUL IF SWALLOWED OR INHALED. Can cause irritation of eyes and skin. May cause respiratory tract irritation and in extreme cases ulceration and perforation of the respiratory tract. Avoid contact with eyes and skin. Avoid breathing dusts. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Keep from contact with clothing and other combustible materials.
Potential Health Effects: Eyes
Exposure to particulates or solution of this product may cause redness, pain and blurred vision. Prolonged contact may cause corneal injury.
Potential Health Effects: Skin
This product can cause irritation of the skin with pain, itching and redness. Depending on the duration of skin contact, skin overexposures may cause chemical burns, resulting in blistering of skin and possible scarring. Repeated skin overexposures can result in dermatitis.
Potential Health Effects: Ingestion
Harmful if swallowed. May cause gastrointestinal irritation with symptoms such as nausea, vomiting, and diarrhea.
Potential Health Effects: 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 and upper respiratory tract can occur.
HMIS Ratings: Health Hazard: 3* **Fire Hazard:** 0 **Physical Hazard:** 1
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe *Chronic hazard

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, rinse immediately with plenty of water for at least 20 minutes. Seek immediate medical attention.

First Aid: Skin

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.

First Aid: 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.

First Aid: Inhalation

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.

First Aid: Notes to Physician

Provide general supportive measures and treat symptomatically.

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

Flash Point: Not flammable
Method Used: Not applicable
Upper Flammable Limit (UEL): Not applicable
Lower Flammable Limit (LEL): Not applicable
Auto Ignition: Not applicable
Flammability Classification: Not applicable
Rate of Burning: Not applicable

General Fire Hazards

Copper Chloride Dihydrate is not combustible, however it is corrosive and presents a severe inhalation and contact hazard to firefighters. When involved in a fire, this material may decompose and produce corrosive and/or toxic gases.

Hazardous Combustion Products

Hydrogen Chloride and copper fumes.

Extinguishing Media

Use methods for the surrounding fire and other materials involved in the 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: 3 **Fire:** 0 **Reactivity:** 1 **Other:**
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

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

Containment Procedures

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 (see Section 10 for incompatibility information).

Clean-Up Procedures

Wear appropriate protective equipment and clothing during clean-up. Shovel the material into waste container. Thoroughly wash the area after a spill or leak clean-up. Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials which burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

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

Handling Procedures

All employees who handle this material should be trained to handle it safely. 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 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 corrosion- and 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. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. 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. Never store food, feed, or drinking water in containers which held this product. Keep this material away from food, drink and animal feed. Do not store this material in open or unlabeled containers. Limit quantity of material stored.

* * * 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.

ACGIH:	1 mg/m^3 TWA (dusts & mists) 0.2 mg/m^3 TWA (fume)	OSHA:	1 mg/m^3 TWA (dusts & mists) 0.1 mg/m^3 TWA (fume)
NIOSH:	1 mg/m^3 TWA (dusts & mists) 0.1 mg/m^3 TWA (fume)	DFG MAKs	1 mg/m^3 TWA Peak, 30 minutes, average value (dusts & mists) 0.1 mg/m^3 TWA Peak, 30 minutes, average value (fume)

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.

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) or equivalent Standards of Canada. 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.

* * * Section 8 - Exposure Controls / Personal Protection (Continued)* * *

Personal Protective Equipment: Respiratory (continued)

NIOSH Guidelines (continued):

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. Additionally, substance is reported to cause eye irritation or damage; may require eye protection.

Personal Protective Equipment: General

Have an eyewash fountain and safety shower available in the work area.

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

Physical Properties: 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.

Appearance:	Blue-green crystals or powder	**Odor:**	Odorless
Physical State:	Solid	**pH:**	4 (0.2 M solution @ 4 deg C)
Vapor Pressure:	Practically zero	**Vapor Density:**	Not applicable
Boiling Point:	Decomposes	**Melting Point:**	110 deg C (at 760 mm Hg)
Solubility (H2O):	110 g/100 cc (@ 0 deg C)	**Specific Gravity:**	2.51 (H2O = 1)
Freezing Point:	Not available	**Particle Size:**	Not available
Softening Point:	Not available	**Bulk Density:**	60-70 lb/ft^3
Molecular Weight:	170.48	**Chemical Formula:**	CuCL2*2H20

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

Chemical Stability

Copper Chloride Dihydrate is stable.

Chemical Stability: Conditions to Avoid

Copper Chloride Dihydrate may decompose in excessive moisture or heat. Avoid high temperatures, and incompatible materials.

Incompatibility

Incompatible with potassium, sodium, nitromethane, hydrazine, sodium hypobromine, and alkali metals. In the presence of moisture, Copper Chloride can corrode metals. Contact with acid or acidic fumes can generate hydrogen chloride. Mixtures of potassium or mixtures of sodium and Copper Chloride can produce a strong explosion on impact. Solutions of sodium hypobromite are decomposed by powerful catalytic action of cupric ions, even as impurities. If heated to decomposition, hydrogen chloride can be produced.

Hazardous Decomposition

Hydrogen Chloride 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 its caustic properties. Harmful or fatal if swallowed. Product is an eye and skin irritant, and can 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 and may result in discoloration of skin or hair. 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. General toxicological studies were done on cupric chloride by exposing rats daily, uninterrupted, for a long time via inhalation and also by epicutaneous route. The concentration below which no toxic effect is anticipated, based on the general toxicological studies, and allergenic and embryotropic effects, for cupric chloride is 0.003 mg/cu m. This level is recommended as the max permissible concentration in a the workplace air.

* * * Section 11 - Toxicological Information (Continued)* * *

B: Component Analysis - LD50/LC50

There are no toxicological data available for Copper Chloride Dihydrate (10125-13-0), however there are toxicological data available for a related compound as follows:

Copper Chloride, Anhydrous (7447-39-4)

DNA Damage-mic-Unspecified effects 2 mmol/L; DNA damage-Mammal-species unspecified Lymphocyte: 2 mmol/L; Mutation in Microorganisms-Saccharomyces cerevisiae 100 mmol/L; Oral-rat LD_{50}: 584 mg/kg: Behavioral: somnolence (general depressed activity), convulsions or effect on seizure; threshold; Inhalation-Rat TCLo: 20 mg/m^3/26 weeks-intermittent; Inhalation-rat TCLo: 8 $\mu g/m^3$: female 1-21 day(s) after conception; Reproductive: Fertility: post-implantation mortality; e.g. dead and/or resorbed implants per total number of implants), Reproductive: Effects on Embryo or Fetus: extra-embryonic structures (e.g., placenta, umbilical cord); fetotoxicity (except death, e.g., stunted fetus; Intraperitoneal-rat LD_{50}: 14700 µg/kg: Behavioral: somnolence (general depressed activity), convulsions or effect on seizure threshold; Intravenous-rat LD_{50}: 5 mg/kg: Behavioral: somnolence (general depressed activity), convulsions or effect on seizure threshold; Oral-mouse LD_{50}: 233 mg/kg: Behavioral: somnolence (general depressed activity), convulsions or effect on seizure threshold; Intraperitoneal-Mouse TDLo: 35 mg/kg (female 12-18D post): Reproductive effects; Intraperitoneal-Mouse LD_{50}: 7400 mg/kg; Intraperitoneal-mouse TDLo: 35 mg/kg: female 12-18 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants), Effects on Embryo or Fetus: fetal death; Intravenous-Mouse LD_{50}: 17,500 mg/kg

B: Component Analysis - TDLo/LDLo

Copper Chloride Dihydrate (10125-13-0)

No information available.

Carcinogenicity

A: General Product Information

No information available.

B: Component Carcinogenicity

Copper dusts and mists, as Cu (7440-50-8)

EPA: EPA-D (Not Classifiable as to Human Carcinogenicity - inadequate human and animal evidence of carcinogenicity or no data available).

Epidemiology

No information available.

Neurotoxicity

Has not been identified.

Mutagenicity

No information available.

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. Persons with pre-existing skin disorders, impaired liver, kidney or pulmonary function may also be more susceptible to the effects of this product.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Harmful to aquatic life in very low concentrations. Copper Chloride Dihydrate is toxic to fish and marine organisms when applied to streams, rivers, ponds or lakes.

B: Ecotoxicity

Copper Chloride Dihydrate (10125-13-0)

LC_{50} (*Crassius auratus*, goldfish) = 0.009 ppm (as Cu), fresh water, rapid death; LC_{50} (oyster) = 0.1-0.5 ppm, salt water, toxic; LC_{50} (mussel) 12 hours = 0.55 ppm, salt water, killed

Environmental Fate

Copper Chloride Dihydrate:

Food Chain Concentration Potential: Can be concentrated by food chain.

Biodegradation: No evidence was found to indicate that there is any biotransformation process for copper compounds which would have a significant bearing on the fate of copper in aquatic environments.

Bioconcentration: As an essential nutrient, copper is accumulated by all plants, and animals. Bioconcentration factors are the ratio derived from the concentrations of the element in the aquatic organism (in ppm of wet wt) divided by the concentration of the element in water (in ppm) (tabular data) Algae: *Scenedesmus guadricarda*, 12; Anabaena variabilis, 300; *Scenedesmus* sp, 2400;, and *Chlorella* sp, 2400; bacteria 630-1567; plants (marine, and fresh), 1,000; invertebrates (marine), 670, and invertebrates (freshwater), 1000; mollusks, 30,000; insects, 546; Fish (marine), 667, and fish (freshwater), 200.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

A: General Product Information

As shipped, this product is not considered a hazardous waste. Solutions of Copper Chloride may require an EPA waste code D002 for corrosivity.

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.

* * * 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 July 24, 2009 Information

UN/NA #: UN 2802
Shipping Name: Copper Chloride
Hazard Class: 8
Packing Group: III
Required Label(s): 8(Corrosive)
Special Provision: IB8, IP3
Packaging: 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.

Additional Shipping Information

Limited Quantity Shipments: Shipments, except for air, need not be marked with the Proper Shipping Name of the contents, but shall be marked with the UN Number (2802) of the contents, preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. 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 1kg (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 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.

* * * Section 14 – Transportation Information Air * * *

50th Edition International Air Transport Association (IATA):

For Shipments by Air transport: This information applies to air shipments both within the U.S. and for shipments originating in the U.S., but being shipped to a different country

UN/NA #: UN 2802
Proper Shipping Name: Copper Chloride
Hazard Class: 8
Packaging Group: III
Passenger & Cargo Aircraft Packing Instruction: 822
Passenger & Cargo Aircraft Maximum Net Quantity: 25 kg
Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y822
Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 5 kg
Cargo Aircraft Only Packing Instruction: 823
Cargo Aircraft Only Maximum Net Quantity: 100 kg
Excepted Quantities: E1
Special Provisions: None
ERG Code: 8L

Limited Quantity Shipments: Shipments for air must be marked with the Proper Shipping Name, Copper Chloride, and shall be marked with the UN Number (2802) preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. The total weight of each outer packaging cannot exceed 30 kg.

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g per receptacle and the aggregate quantity of this material per completed package does not exceed 1kg. The inner receptacles must be securely packed in an intermediate 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. The completed package must meet a drop test. The requirements are found in 2.7.6.1. The package must not be opened or otherwise altered until it is no longer in commerce. For air 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 x 100 mm and must be durable and clearly visible.

* * * Section 14 – Transportation Information Vessel * * *

Amendment 34-08 International Maritime Dangerous Goods (IMDG) Code
For shipments via marine vessel transport, the following classification information applies.

UN/NA #: UN 2802
Proper Shipping Name: COPPER CHLORIDE
Hazard Class: Class 8
Packing Group: III
Special Provisions: None
Limited Quantities 500g
Excepted Quantities: E1
Packing Instructions: P002/LP02
Provisions: None
IBC Instructions IBC08
Provisions: B3
EmS: F-A, S-B
Stowage and Segregation: Category A. **Marine Pollutant:** This material is a marine pollutant and shipments of the material must carry the new marking Refer to IMO Amendment 34-08 Chapter 2.9 and 2.10.

Limited Quantity Shipments: Shipments need not be marked with the Proper Shipping Name of the contents, but shall be marked with the UN Number (2802) of the contents, preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. The total weight of each outer packaging cannot exceed 30kg.

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30g per receptacle and the aggregate quantity of this material per completed package does not exceed 1,000g. Maximum number of packages per Cargo Transport Unit (CTU) shall not exceed 1,000 packages. The inner receptacles must be securely packed in an intermediate 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 29 kg. The completed package must meet a drop test. The requirements are found in 3.5.3.1. Packages must not be opened or otherwise altered until it is no longer in commerce and a 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 x 100 mm and must be durable and clearly visible.

Material can be converted to a less hazardous material by weak reducing agents followed by neutralization.

* * * Section 15 – Regulatory Information * * *

US Federal Regulations

A: General Product Information
Copper Chloride Dihydrate (CAS # 10125-13-0) 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 lb (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.

* * * Section 15 – Regulatory Information (Continued) * * *

US Federal Regulations (Continued)

Cupric Chloride (7447-39-4)

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
	7447-39-4	No	No	No	Yes	Yes

State Regulations

A: General Product Information

California Proposition 65

Copper Chloride Dihydrate 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:

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
Cupric Chloride Anhydrous	7447-39-4	No	No	No	No	No	Yes

Other Regulations

A: General Product Information

No other information available.

B: Component Analysis – Inventory

Copper Chloride Dihydrate is excepted from listing as a hydrate of the listed Copper Chloride Anhydrous.

Component	CAS #	TSCA	DSL	EINECS
Copper Chloride Dihydrate	10125-13-0	No	No	No

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Copper Chloride Dihydrate	10125-13-0	1 percent

ANSI LABELING (Z129.1): **DANGER!** MAY BE FATAL IF SWALLOWED. CAUSES SKIN AND EYE BURNS. HARMFUL IF INHALED. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing dusts or particulates. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH/MSHA-approved respiratory protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO_2, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material or neutralizing agent for acids. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

* * * 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.

* * * Section 16 - Other Information (Continued) * * *

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: Sue Palmer-Koleman, PhD **Contact Phone:** (713) 896-9966

Revision log

08/04/00 2:38 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 4:16 PM CLJ Changed contact to Sue, non-800 Phone Number for Chemtrec.
02/15/02 11:01 AM HDF Revision of SARA Chronic Hazard Rating to "Yes".
09/16/03: 7:35 AM 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 2:16 PM SEP Update IATA Section 14
09/05/06 2:44 PM SEP Updated DOT & IMO Section 14
10/10/08 3:07 PM DLY Changed Chem One Physical Address, Section 1
09/18/09 SEP-MSK UPDATE IATA

This is the end of MSDS # C1-115