Material Safety Data Sheet

Material Name: Cupric Carbonate ID: C1-178

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

Chemical Name: Cupric Carbonate, Light or Dense Powder
Product Use: For Commercial Use
Synonyms: Basic Copper Carbonate, Copper (II) Carbonate, Copper (II) Carbonate Hydroxide
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
12069-69-1	Copper(II) carbonate hydroxide, 70% (as CuO2, Dry)	70

Component Related Regulatory Information
This product may be regulated, have exposure limits or other information identified as the following: Copper (7440-50-8).
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
Product is a green solid existing as a fine powder. Use methods suitable for surrounding fire. Avoid breathing dusts. May cause irritation to the nose, throat, and upper respiratory tract. This product is irritating to the eyes and skin. Harmful or fatal if swallowed. Firefighters should wear full protective equipment and clothing when fighting a fire involving this material. High concentration of airborne dust may pose an explosion hazard.
Hazard Statements
WARNING! Irritating to the eyes and respiratory system. May be harmful if inhaled or swallowed. Avoid breathing dusts and fumes. Avoid contact with eyes. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.
Potential Health Effects: Eyes
This product is irritating to the eyes. Exposure may result in irritation, pain, swelling, tearing, or photophobia. Copper salts may produce conjunctivitis or even ulceration and clouding of the cornea.
Potential Health Effects: Skin
Copper salts are irritating to the skin, and may produce itching, redness, and rash. This product may cause skin discoloration.
Potential Health Effects: Ingestion
High-level acute ingestion of copper salts may produce nausea, vomiting and epigastric burning pain, followed by hemolysis, anemia, and liver and kidney damage secondary to hemolysis. Vomitus is characteristically greenish-blue. Mucosal erosion, a metallic taste in the mouth, and bloody diarrhea may occur. Hypotension, lethargy, and coma are potential CNS effects that may result from ingestion of large quantities of this product.
Potential Health Effects: Inhalation
Inhalation of dust and mists of copper salts can result in irritation of nasal mucous membranes, sometimes of the pharynx and, on occasion, ulceration with perforation of the nasal septum. Inhalation of fumes or fine dust may cause metal fume fever with resulting flu-like symptoms involving fever, chills, sweats, muscle aches and pains, cough, and general malaise.

HMIS Ratings: Health Hazard: 2 * **Fire Hazard:** 1 **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
Immediately flush eyes with large amounts of room temperature water, occasionally lifting the lower and upper lids, for at least 15 minutes. If symptoms persist after 15 minutes of irrigation, seek medical attention.
First Aid: Skin
For skin contact, wash immediately with soap and water. Get medical attention if irritation or pain persists.

* * * Section 4 - First Aid Measures (Continued) * * *

First Aid: Ingestion

If the material is swallowed, get immediate medical attention or advice. Do not induce vomiting unless directed to do so by medical personnel. Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Emesis is generally rapid and spontaneous in individuals who have ingested copper salts.

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. Consult nearest Poison Control Center for all exposures except minor instances of inhalation or skin contact.

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

Flash Point: Not applicable.
Method Used: Not applicable.
Upper Flammable Limit (UFL): Not available.
Lower Flammable Limit (LFL): Not available.
Auto Ignition: Not available.
Flammability Classification: Not available.
Rate of Burning: Not available.

General Fire Hazards

High concentration of airborne dust may pose an explosion hazard. Prevent human exposure to fire, smoke, fumes, or products of combustion.

Hazardous Combustion Products

When heated to decomposition, this product emits acrid smoke and fumes, including copper oxide fumes.

Extinguishing Media

Use methods for the surrounding fire and other materials involved in the fire. Dry chemical, foam, carbon dioxide, or water spray are recommended.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self contained breathing apparatus.

NFPA Ratings: Health: 2 **Fire:** 1 **Reactivity:** 1 **Other:** 0
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. Solutions of the compound can be neutralized with lime or similar compound. Avoid contamination of soil, and prevent spill residue from running to groundwater or storm drains.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials that 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.

* * * Section 7 - Handling and Storage (Continued) * * *

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 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. Never store food, feed, or drinking water in containers that held this product. Keep this material away from food, drink and animal feed. 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

The ACGIH 1997 Notice of Intended Changes lists, as Cu: fume and respirable particulate: (0.05) mg/m3 TWA; inhalable particulate dusts and mists (1) mg/m3 TWA.

B: Component Exposure Limits

Copper(II) carbonate hydroxide (12069-69-1)

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:1•MAK 15 minutes, average value, 1-hr interval (copper and inorganic copper compounds)
0.1 mg/m^3 TWA Peak: 2•MAK 15 minutes, average value, 1-hr interval (fume)

Engineering Controls

Ventilation must be sufficient to effectively remove and prevent buildup of dust or fumes that may be generated during handling or thermal processing. Local exhaust is suggested for use, where possible, in enclosed or confined spaces.

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 chemical 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

Use 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. 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.

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

Personal Protective Equipment: Respiratory (continued)

NIOSH Guidelines for respiratory equipment for Copper dusts and mists (as Cu) [continued]:

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

A safety shower and eye-wash fountain should be readily available where this product is handled. Use good hygiene practices when handling this material, including changing and laundering work clothing after use.

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

Physical Properties: Additional Information

The data provided in this section are 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:	Fine green powder.	**Odor:**	None.
Physical State:	Solid.	**pH:**	Not applicable.
Vapor Pressure:	Not applicable.	**Vapor Density:**	Not applicable.
Boiling Point:	Not applicable.	**Freezing/Melting Point:**	Not available.
Solubility (H2O):	Insoluble in water. Soluble in acids.	**Specific Gravity:**	Not available.
Softening Point:	Not applicable.	**Particle Size:**	Not available.
Viscosity:	Not applicable.	**Evaporation Rate:**	Not applicable.
Percent Volatile:	Not available.	**Bulk Density:**	100-135 lbs/ft3
Decomposition Temperature	200 deg C (392 deg F)	**Molecular Weight:**	221.11
		Chemical Formula:	CuCO3•Cu(OH)2

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

Chemical Stability

Stable.

Chemical Stability: Conditions to Avoid

Ignition sources, incompatible materials, alkalis, reducing agents, and strong oxidants.

Incompatibility

Copper forms potentially explosive reactions with actylenic compounds, ammonium nitrate, 3-bromopropyne, ethylene oxide, sodium azide, and lead azide. Copper salts, including Copper Carbonate may react to form explosive acetylides when in contact with acetylene or nitromethane. A combination of finely divided copper with finely divided bromates (also chlorates or iodates) of barium, calcium, magnesium, potassium, sodium, or zinc will explode with heat, percussion and sometimes light friction. Reducing agents react vigorously with copper salts.

Hazardous Decomposition

When heated to decomposition, this product emits acrid smoke and fumes, including copper oxide fumes.

Hazardous Polymerization

Will not occur.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Target organs include the respiratory system, skin, eyes, liver, and kidney. Product causes eye and skin irritation. Systemic effects can occur from high-level acute ingestion of copper salts, which can be absorbed from the stomach and produce nausea, vomiting and epigastric burning pain, followed by hemolysis, anemia, and liver and kidney damage secondary to hemolysis. If copper salts from inhalation in sufficient concentration reach the GI tract, they act as irritants producing salivation, nausea, vomiting, gastric pain, hemorrhagic gastritis, and diarrhea. Repeated exposure to copper fume and fine dust is known to cause metal fume fever, a flu-like condition involving fever, chills, sweats, muscle aches and pains, cough, and general malaise. Symptoms begin within a few hours after exposure and subside within 24 to 48 hours, leaving no permanent effects. Metal fume fever has been reported in workers exposed to an extremely fine copper dust at concentrations of 0.075 to 0.12 mg/m3. Exposure may depress mental status, resulting in lethargy and coma. No chronic lung damage has been attributed solely to copper. Chronic exposure to low levels of copper has been reported to induce anemia, probably from hemolytic effects. Allergic contact dermatitis has been reported, but is extremely rare.

B: Component Analysis - LD50/LC50

Copper(II) carbonate hydroxide (12069-69-1)

Oral LD50 Rat: 1350 mg/kg

Carcinogenicity

A: General Product Information

Neither copper nor its inorganic salts are regarded as human carcinogens.

B: Component Carcinogenicity

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

Epidemiology

No information available.

Neurotoxicity

Lethargy and coma have been reported in patients with severe copper sulfate intoxication, and might develop after ingestion of other copper salts, such as Copper Carbonate.

Mutagenicity

Copper derivatives were not mutagenic in the Ames Salmonella assay, however, copper was found to be mutagenic in other assays.

Teratogenicity

Copper was not teratogenic in hamsters. The results of teratogenicity studies in rats have been conflicting. Copper may have been toxic to the sperm and embryos of rats when inhaled, and to mice when given orally.

Other Toxicological Information

Individuals with Wilson's Disease (a hereditary disease associated with the inability to remove copper from the blood) may be at greater risk when exposed to this product.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

Product may be toxic to fish and marine organisms. Do not contaminate water by cleaning of equipment or disposal of wastes. Copper compounds are considered a toxic pollutant under the U.S. Clean Water Act. Copper carbonate is used in insecticides and fungicides.

Environmental Fate

Not biodegradable. Water insoluble. If released to soil, Copper Carbonate 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.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

A: General Product Information

As shipped, this product is not considered a hazardous waste under 40 CFR 261 (RCRA).

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product.

* * * Section 13 - Disposal Considerations (Continued) * * *

Disposal Instructions

Review federal, provincial, and local government requirements prior to disposal. Do not allow this material to drain into sewers/water supplies. Disposal by secure landfill may be acceptable.

* * * Section 14 - Transportation Information * * *

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 I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information

UN/NA #: Not Applicable
Shipping Name: Non-regulated
Hazard Class: Not Applicable
Packing Group: Not Applicable
Required Label(s): None

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 3077
Proper Shipping Name: Environmentally Hazardous Substance, solid, n.o.s. (Cupric Carbonate)
Hazard Class: 9 (Miscellaneous Dangerous Goods)
Packing Group: III
Passenger & Cargo Aircraft Packing Instruction: 911
Passenger & Cargo Aircraft Maximum Net Quantity: 400 kg
Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y911
Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg G
Cargo Aircraft Only Packing Instruction: 911
Cargo Aircraft Only Maximum Net Quantity: 400 kg
Excepted Quantities: E1
Special Provisions: A97, A158
ERG Code: 9L

Limited Quantity Shipments: Shipments for air must be marked with the Proper Shipping Name Environmentally Hazardous Substance, solid, n.o.s. (Cupric Carbonate) and shall be marked with the UN Number (3077) 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.

International Maritime Organization (I.M.O.) Classification

Cupric Carbonate is not regulated under I.M.O

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

"Copper compounds" as a category is listed under the Clean Water Act as a Toxic Pollutant.

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(II) carbonate hydroxide (12069-69-1)

SARA 313: form R reporting required for 1.0% de minimus concentration (related to Copper)
(no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches) (related to Copper)

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Copper(II) carbonate hydroxide	12069-69-1	No	No	No	Yes	Yes

State Regulations

A: General Product Information

California Proposition 65

Copper Carbonate is not on the California Proposition 65 chemical lists.

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

US Federal Regulations (continued)

State Regulations (continued)

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(II) carbonate hydroxide	12069-69-1	Yes	Yes	Yes	Yes	Yes	Yes

Other Regulations

A: General Product Information

Not applicable.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Copper(II) carbonate hydroxide	12069-69-1	Yes	Yes	Yes

ANSI Labeling (Z129.1):

WARNING! IRRITATING TO THE EYES AND RESPIRATORY SYSTEM. MAY BE HARMFUL IF INHALED OR SWALLOWED. Avoid breathing dusts or particulates. Do not get on skin or in eyes. Do not taste or swallow. Keep container closed. Use with adequate ventilation. Keep from contact with clothing. Wash thoroughly after handling. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH-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. 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.

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 NA = Not available or not applicable g = grams; kg = kilograms M = molar; C = Celsius DOT = Dept. of Transportation

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

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

Revision log

08/04/00 2:20 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 3:07 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.

02/15/02 11:01 AM HDF Revision of SARA Chronic Hazard Rating to “Yes”.

02/20/03: 11:00 am HDF Addition of NIOSH respiratory guidelines for copper compounds. Up-date of HMIS ratings to current rating titles. Up-graded Section 10 Reactivity Information. Up-Dated entire Section 14 Transportation Information to include IATA, IMO transport information.

09/16/03 9:01 AM HDF Up-grade of First-Aid information in Section 4. Up-date of DFG MAK exposure limits.

06/22/05 2:07PM SEP Update IATA Section 14

10/17/07 4:16 PM SEP Update IATA Section 14, Section 15 CERCLA, no RQ.

10/10/08 3:07 PM DLY Changed Chem One Physical Address, Section 1

12/03/2010 1:56 PM SEP Update IATA

This is the end of MSDS # C1-178