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OLD WATERWORKS ROAD
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MATERIAL SAFETY DATA SHEET

June 1, 2007

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Common Name: COPPER AMMONIUM CHLORIDE/AMMONIUM CHLORIDE

Trade Name: Final Etch 5 Starter

Manufacturer: Old Bridge Metals & Chemicals, Inc.
P.O. Box 194
Old Bridge, New Jersey 08857

Telephone: (732) 727-2229

Emergency Telephone: (800) 275-3924

24 Hour Emergency Telephone: (800) 424-9300 (Chemtrec)

HAZARDOUS CLASSIFICATION: NFPA: Health-3 / Fire-0 / Reactivity-0

HMIS: Health-3 / Fire-0 / Reactivity-0

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SECTION I. MATERIAL IDENTIFICATION

Common Name: Copper Ammonium Chloride /Ammonium Chloride
Molecular Formula: $\text{Cu}(\text{NH}_3)_4\text{Cl}_2$
EPA Reg. Number: None
CAS Number: 1336-21-6

SECTION II. HAZARDOUS INGREDIENTS

Ammonium Chloride: CAS No. 12125-02-9
LD50: 1650 mg/Kg.
Ammonium Hydroxide: CAS No. 1336-21-6
LD50: 350 mg/Kg.
Inorganic Copper: CAS No. 7440-50-8
LD 50: 120 mg/Kg. (oral, Human)

SECTION III. PHYSICAL DATA

Physical State:	Blue solution
Boiling Point:	212° F
Melting Point:	Not applicable
Specific Gravity:	1.23
Solubility in H ₂ O:	Completely
Appearance:	Blue solution
Odor:	Ammonia
Vapor Pressure:	170 mm Hg

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point:	Not applicable
Flammable Limits:	Not flammable
Extinguishing Media:	Copper Ammonium Chloride does not burn nor will it support combustion. If stored with other combustible materials use water, CO ₂ or dry chemical.
Special Fire Fighting Instructions:	Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus when any chemical is involved in a fire.
Fire and Explosion Hazards:	None

SECTION V. REACTIVITY DATA

Conditions to Avoid:	Product is highly soluble but does not react with water.
Incompatibility:	Reducing agents; silver, mercury, acids.
Hazardous Decomposition products:	Ammonia
Polymerization:	Will not occur.

SECTION VI. HEALTH AND HAZARD INFORMATION

Swallowing:	Toxic orally in accordance with FHSLA regulations.
Skin:	Skin irritation
Eyes:	Corrosive in accordance with FHSLA regulations. Eye irritation
Inhalation:	Inhalation of mist may cause irritation to the upper respiration tract.

This product contains Copper Chloride subject to the reporting requirements of Section 13 of the Emergency Planning and Community-right-to-Know-Act of 1986 (40CFR372).

SECTION VII. FIRST AID PROCEDURES

Swallowing:	Give large amounts of milk or water. Do not induce vomiting. Call Poison Control Center or a physician. Never give anything to an unconscious person.
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Skin:	Immediately flush skin with plenty of water for 15 minutes. Call a physician if irritation persists. Remove and wash contaminated clothing before reuse. Remove and destroy contaminated shoes.
Eyes:	Immediately flush eyes with plenty of water for 15 minutes. Hold eyelids apart during irrigation. Call a physician.
Inhalation:	Remove person to fresh air and call a physician.

NOTE TO PHYSICIAN: Corrosive. May cause stricture. If lavage is performed, suggest endotracheal and/or esophagosopic control. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care; treatment based upon judgment of physician in response of the patient.

SECTION VIII. HANDLING PRECAUTIONS

Exposure Guidelines:	ACGIH, TLV and OSHA PEL are 5 ppm ceiling for hydrogen chloride.
Personal Protective Equipment:	Chemical safety goggles. Rubber gloves and rubber apron should be worn.
Ventilation:	Provide general and/or local exhaust ventilation to control airborne levels below exposure guidelines. Alternatively, provide respiratory protection equipment in accordance with Paragraph 1910.134 of Title 29 of the Code of Federal Regulations.

SECTION IX. ENVIRONMENTAL AND DISPOSAL INFORMATION

Aquatic Toxicity:	Copper compounds are very toxic to aquatic life.
Spills and Leaks:	Comply with Federal, State and local regulations on reporting spills. Do not wash away the solution.
Recover:	If product is in a confined solution, react with Sodium Hydroxide to form an insoluble Copper Hydroxide solid that can be scooped up.
Waste Disposal:	Do not reuse container. Comply with Federal, State and local regulations. Vacuum up solutions or scoop up insoluble Copper Hydroxide and dispose of in an approved landfill.
Environmental Effects:	May be dangerous if it enters the public water systems. Follow local regulation. Toxic to fish and plants.

SECTION X. SPECIAL PRECAUTIONS

Storage:	Store in plastic drums or plastic storage tank.
Other Precautions:	All precautions should be taken to prevent skin and eye contact with this material. Design of equipment and operational procedures should be such that the

possibility of skin and eye contact does not exist.

SECTION XI. REGULATORY INFORMATION

NOTICE: The information herein is presented in good faith and believed to be accurate. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's responsibility to ensure that its activities comply with Federal, State and local laws.

U.S. REGULATIONS: SARA 313 Information; This product contains the following substance subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:
COPPER 10.0%

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following category:

AN IMMEDIATE HEALTH HAZARD

SECTION XII. SHIPPING INFORMATION

IN 55 GALLON DRUMS, CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,
(COPPER AMMONIUM CHLORIDE AND AMMONIUM CHLORIDE) 8, UN3266,
PG III, ERG 154

SECTION XIII. MSDS PREPARATION INFORMATION

Prepared by: Stephen Wolenuk
Laboratory Director