MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): **COPPER PEN PALS®**
COPPER PLATING SOLUTIONS AND KITS

SYNONYMS: Not Applicable
CHEMICAL NAME/CLASS: Cyanide Solution
PRODUCT USE: Copper Plating

SUPPLIER/MANUFACTURER'S NAME: COHLER ENTERPRISES, INC.
ADDRESS: 101 North Haven Street,
Baltimore, MD 21224

EMERGENCY PHONE: 1-800-424-9300 (CHEMTREC)
BUSINESS PHONE: (410) 342-1400
DATE OF PREPARATION/REVISION: July 23, 1999/June 9, 2005

2. COMPOSITION and INFORMATION ON INGREDIENTS

These products are packaged in 1 ounce to 1 quart containers. The information presented in this document is directed to potential exposure and release situations pertinent to this product's volume.

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA			
			TWA mg/m³	STEL mg/m³	TWA mg/m³	STEL mg/m³	IDLH mg/m³	OTHER mg/m³
Copper Exposure limits are for Copper fume and dusts & mists, as Cu	7440-50-8	< 1	0.2 (fume) 1 (dusts & mists)	NE	0.1 (fume) 1 (dusts & mists)	NE	100 (as Cu)	NIOSH REL: TWA = 0.1 (fume); 1 (dusts & mists)
Potassium Cyanide Note: The following exposure limits are for Potassium Cyanide as CN.	151-50-8	< 1	NE	5 ©, Skin)	5 (Skin)	NE	NE	NIOSH REL: STEL = 5 (Ceiling, 10 min.) DFG MAK: TWA = 5 - **I** (skin)
Water and other components. Each of the other components are present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).		Balance	None of the other components contribute significant additional hazards at the concentrations present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards and Canadian Workplace Hazardous Materials Identification System Standards (CPR 4).					

I - Measured as Inhalable Fraction of aerosol
NE = Not Established C = Ceiling Limit See Section 16 for Definitions of Terms Used
NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1998 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This colorless to light-yellow liquid has a slight, almond-like odor. **Health Hazards:** This product is severely irritating to exposed tissue. This solution is poisonous; ingestion of small quantities can be fatal. Additionally, inhalation over-exposures may be harmful or fatal . **Flammability Hazards:** This product is not flammable under normal conditions; however if heated to decomposition, this solution may produce irritating and toxic vapors containing potassium, copper and cyanide compounds. **Reactivity Hazards:** This product is not normally reactive at standard temperatures and pressures. Contact with acid may generate toxic hydrogen cyanide gas. **Emergency Response:** Emergency responders must wear proper personal protective equipment and have adequate fire protection for the incident to which they are responding. Caution must be used when responding to spills.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The primary routes of over-exposure for this product would be via inhalation, contact with skin and eyes, and skin absorption. The following paragraphs describe the symptoms of overexposure, via route of entry.

INHALATION: Over-exposure to mists or sprays of this product by inhalation may cause irritation of the nose, throat and respiratory tract. Inhalation over-exposures to this product can also cause cyanide poisoning. Symptoms can be delayed. Symptoms of such poisoning can include weakness, headache, confusion, nausea, vomiting, convulsions, coma and possibly death. Inhalation of large quantities of mists or vapors of this product may result in severe irritation of lungs, resulting in chemical pneumonitis and pulmonary edema (a life-threatening accumulation of fluid in lungs).

CONTACT WITH SKIN or EYES: Brief contact with the skin is irritating; repeated or prolonged skin contact can cause dermatitis (i.e. red, inflamed skin) and "Cyanide Rash" (i.e. itching, macular, papular and vesicular eruptions). Potassium Cyanide (a component of this product), is a sensitizer and can cause the development of allergy-like skin reactions (i.e. rashes and welts). Symptoms of skin contact may be delayed. If splashed into the eyes, the solution will cause immediate irritation or burns. Symptoms of such over-exposure include discomfort, tearing, and blurring of vision. Repeated or prolonged exposures of this product with the eyes can also cause corneal opacity (clouding of the surface of the eye) and possibly permanent eye injury. Chronic exposure may damage optic nerves.

SKIN ABSORPTION: Potassium Cyanide (a component of this product) can be absorbed through the skin. Symptoms of such over-exposure will include those described for "Inhalation" and "Contact With Skin or Eyes". Repeated or prolonged over-exposures can be fatal.

INGESTION: Though not anticipated to be a significant route of occupational exposure, ingestion of this product, even in small quantities, can be fatal. Symptoms of "Cyanide Poisoning" may result, which are described under "Inhalation".

INJECTION: Accidental injection of this liquid will cause local pain and irritation and systemic symptoms similar to those of over-exposure by "Inhalation".

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. Over-exposure to this liquid may cause the following symptoms:

ACUTE: This product is poisonous and over-exposures can be fatal if ingested, inhaled or absorbed through the skin. This product can be severely irritating and potentially damaging to contaminated tissue.

CHRONIC: Chronic over-exposures to this solution can cause dermatitis (inflammation of the skin) after prolonged or repeated skin contact and may damage optic nerves. Potassium Cyanide is a sensitizer and can cause the development of allergy-like reactions, after low level repeated exposure. Refer to Section 11 (Toxicological Information) for more detailed information of the carcinogenicity of this product.

TARGET ORGANS: Acute: Skin, eyes, respiratory system, liver, kidneys, blood and metabolic enzymes. Chronic: Skin, Eyes.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

IN CASE OF CYANIDE POISONING, START FIRST-AID TREATMENT IMMEDIATELY, THEN CALL PHYSICIAN.

SKIN EXPOSURE: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Minimum recommended flushing is for 15 minutes. If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated below. Victim must seek immediate medical attention.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention.

INHALATION: If vapors or mists of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated below. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If victim is conscious, induce vomiting until vomit fluid is clear. Victim should drink milk, egg whites, or large quantities of water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow. If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated below.

All persons working with this product should be aware of the potential for cyanide poisoning and trained to provide first-aid using oxygen and amyl nitrite. Always have on-hand the materials needed. Actions to be taken in case of cyanide poisoning should be planned and practiced before beginning work with cyanides. Identification of community hospital resources and emergency medical assistance in order that they be equipped and trained on the handling of cyanide emergencies is essential.

ANTIDOTE: If the victim has difficulty breathing, is becoming confused and/or is losing consciousness, administer amyl nitrite. Crush one pearl of amyl nitrite onto a cloth and hold to the victim's nose 15, then take away for 15 seconds. Repeat 5-6 times, using a new pearl every 5 minutes (0.3 mg size) or every 3 minutes (0.18 mg size), until patient regains consciousness. While amyl nitrite is being used, monitor the victim's blood pressure. If it drops below 80/60, stop the amyl nitrite and obtain the opinion of physician immediately. If breathing has stopped, trained personnel should begin artificial respiration or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately (avoid mouth to mouth contact). If breathing is difficult, oxygen (preferably 100 percent) may be helpful. Quickly transport victim to an emergency facility.

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or health professional with victim. Physicians should refer to Section 11 (Toxicology Information) for additional information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Over-exposure to this product may aggravate pre-existing respiratory, blood, and skin conditions.

RECOMMENDATIONS TO PHYSICIANS: Provide prophylactic treatment for "Cyanide Poisoning"; treat symptoms and eliminate over-exposures.

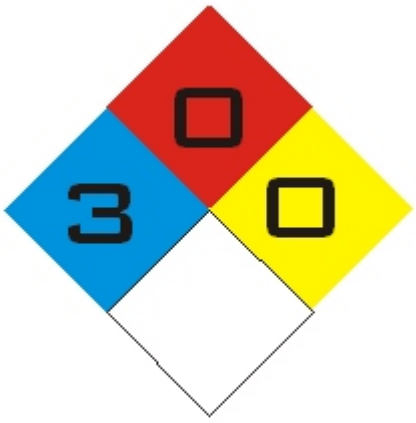
5. FIRE-FIGHTING MEASURES

FLASH POINT, °C (method): Not applicable.
AUTOIGNITION TEMPERATURE, °C: Not applicable.
FLAMMABLE LIMITS (in air by volume, %):

Lower: Not applicable.
Upper: Not applicable.

FIRE EXTINGUISHING MATERIALS: Use suppression agents appropriate for surrounding areas. Direct fire suppression at burning materials.

Carbon Dioxide: OK Foam: OK Water Spray: OK
Dry Chemical: OK Halon: OK Other: OK



NFPA RATING

5. FIRE-FIGHTING MEASURES (Continued)

UNUSUAL FIRE AND EXPLOSION HAZARDS: Due to the presence of cyanide compounds, this solution presents a significant health hazard to fire-fighters. When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (i.e. oxides of carbon, nitrogen and potassium, as wells as cyanide and copper compounds).

Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Fire response equipment should be rinsed with bleach solution, followed by a triple rinse with water. Move fire-exposed containers from the area of the fire, if it can be done without risk to fire-fighters. If possible, fire-fighters should control run-off water to prevent environmental contamination.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by appropriately trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

Minimum recommended level of Personal Protective Equipment for uncontrolled releases should be **Level B: triple-gloves (rubber gloves and nitrile gloves, over latex gloves), chemically resistant suit and boots, hard-hat, and Self-Contained Breathing Apparatus**. Absorb spilled liquid with polypads or other suitable absorbent materials. Rinse the area with a bleach solution followed by triple rinse with water. Decontaminate the area thoroughly. Decontaminate all spill response equipment throughly after clean-up operations are concluded. Place all spill residue in an appropriate container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations, or the appropriate standards of Canada and its provinces (see Section 13, Disposal Considerations).

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: Avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Avoid breathing vapors or mists generated by this product. Do not eat or drink while handling this product. Use ventilation and other engineering controls to ensure exposure limits are below those stated in Section 2 (Composition and Information on Ingredients). Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Use in a well-ventilated location. Open containers slowly, on a stable surface. Containers of this product must be properly labeled. Empty containers may contain residual amounts of this product; therefore, empty containers should be handled with care.

Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Material should be stored in secondary containers, or in a diked area, as appropriate. Keep container tightly closed when not in use. Storage areas should be made of fire-resistant materials. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment: use 10% bleach solution (if possible) or triple rinse with water, before maintenance begins. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures, and dispose of according to applicable U.S. Federal, State, or local procedures or those of Canada and its Provinces.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposures are below the limits provided in Section 2 (Composition and Information on Ingredients). Ensure eyewash/safety shower stations are available near areas where this product is used. Medical treatment kits for cyanide poisoning should be conveniently located for easy access.

RESPIRATORY PROTECTION: None needed under normal circumstances of use. Maintain airborne contaminant concentrations below exposure limits in Section 2 (Composition and Information on Ingredients). If respiratory protection is needed use only protection authorized in 29 CFR 1910.134, or applicable State regulations. Use supplied air respiration protection if oxygen levels are below 19.5% or are unknown. The following respiratory protection guidelines for Potassium Cyanide are provided:

CONCENTRATION	**RESPIRATORY PROTECTION**
UP TO 25 mg/m^3:	Supplied Air Respirator or full facepiece Self Contained Breathing Apparatus.
EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS:	Positive pressure, full facepiece Self Contained Breathing Apparatus; or positive pressure, full facepiece Supplied Air Respirator with an auxiliary positive pressure Self Contained Breathing Apparatus.
ESCAPE:	Gas mask with high-efficiency particulate filter and canister to protect against cyanides; or escape-type Self Contained Breathing Apparatus.

EYE PROTECTION: Splash goggles or safety glasses with side shields are recommended. Face shields are recommended if splashes or sprays can be generated.

HAND PROTECTION: Wear rubber or neoprene gloves for routine industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS.

BODY PROTECTION: Use body protection as necessary to prevent body contact.

HMIS PERSONAL PROTECTIVE EQUIPMENT RATING: Normal use = C (gloves, goggles, body protection).

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY(air = 1): Not available.
SPECIFIC GRAVITY: Not available.
SOLUBILITY IN WATER: Completely soluble.
VAPOR PRESSURE, @ 20°C (68°F): Not available.
ODOR THRESHOLD: Not available.
EVAPORATION RATE (nBuAc=1): Similar to water.
FREEZING/MELTING POINT: 0°C (32°F)
BOILING POINT: 100°C (212°F)
pH: > 12.1
COEFFICIENT WATER/OIL DISTRIBUTION: Not available.
APPEARANCE AND COLOR: Colorless to light-yellow liquid with a slight, almond-like odor.
HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance and odor may be distinguishing characteristics of this product.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: The products of thermal decomposition include oxides of nitrogen, carbon monoxide, carbon dioxide, cyanide, potassium, and copper compounds.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Oxidizers, strong acids, bases and nitrites. Contact of this product with acids or acid salts can release toxic hydrogen cyanide gas.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Incompatible materials.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Toxicology information for the components of this product are as follows:

POTASSIUM CYANIDE:
DNA Inhibition (Mouse, lymphocyte) =1 mmol/L
Cytogenetic Analysis (Mouse, mammary gland) = 1 mmol/L/48 hours
LD_{50} (Oral-Rabbit, adult) = 5 mg/kg
LD_{50} (Subcutaneous-Rabbit, adult) = 4 mg/kg
LD_{50} (Intramuscular-Rabbit, adult) = 3256 mg/kg
LD_{50} (Ocular-Rabbit, adult) = 7870 mg/kg
LDLo (Intraperitoneal-Guinea Pig, adult) =8 mg/kg
LD_{50} (Intramuscular-Pigeon) = 4 mg/kg
TDLo (Oral, Domestic animals, (Goat, Sheep) = 1767 mg/kg (8-20 weeks pregnant/ 44 days post pregnancy; reproductive effects
LD_{50} (Oral-Mouse) = 8500 mg/kg
LD_{50} (Intraperitoneal-Mouse) = 5991 mg/kg

POTASSIUM CYANIDE (continued):
LD_{50} (Subcutaneous-Mouse) = 6500 mg/kg
LD_{50} (Intravenous-Mouse) = 2600 mg/kg
LD_{50} (Subcutaneous-Dog, adult) = 6 mg/kg
LDLo (Intravenous-Dog, adult) = 5 mg/kg
LDLo (Intraperitoneal, Rat) = 45 mg/kg (1-15 days pregnant); teratogenic effects
TDLo (Oral-Woman) = 100 mg/kg; central nervous system effects, pulmonary system effects
LDLo (Oral-Human) = 2857 mg/kg
TDLo (Oral-Man) = 13,699 mg/kg
LD_{50} (Oral-Rat) = 5 mg/kg LD_{50} (Intraperitoneal-Rat) = 4 mg/kg
LD_{50} (Intravenous-Rat) =3600 mg/kg LDLo (Intramuscular-Rat) = 8 mg/kg

COPPER:
LD_{50} (Intraperitoneal-mouse) 3500 µg/kg
TDLo (Oral-Human) 120 µg/kg: Gastrointestinal: nausea or vomiting
TDLo (Oral-rat) 152 mg/kg: female 22 week(s) pre-mating: fetotoxicity; Specific Developmental Abnormalities: Central Nervous System
TDLo (Oral-rat) 1520 µg/kg: female 22 week(s) pre-mating: Reproductive: Specific Developmental Abnormalities: musculoskeletal system
TDLo (Oral-rat) 1210 µg/kg: female 35 week(s) pre-mating: Reproductive: Fertility: pre-implantation mortality, post-implantation mortality

COPPER (continued):
TDLo (Intrapleural-rat) 100 mg/kg: Tumorigenic: equivocal tumorigenic agent; Lungs, Thorax, or Respiration: fibrosis, focal (pneumoconiosis), tumors
TDLo (Intrauterine-rat) 250 µg/kg: female 1 day(s) pre-mating: Reproductive: Maternal Effects: uterus, cervix, vagina; female fertility index

COPPER CYANIDE:
LD_{50} (Oral-rat) 1265 mg/kg

SUSPECTED CANCER AGENT: The components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: This product is corrosive and will cause severe irritation and potential tissue damage by all routes of exposure.

SENSITIZATION TO THE PRODUCT: Potassium Cyanide (a component of this product) is a sensitizer and can cause allergy-like skin reactions upon repeated or prolonged exposure.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not reported to have mutagenic effects in humans. Mutation data are available for Potassium Cyanide (a component of this product); these data were obtained during clinical studies on specific human or animal tissues exposed to high doses of these compounds.
Embryotoxicity: This product is not reported to have embryotoxic effects in humans. Embryotoxic tests on Potassium Cyanide (a component of this product) in animals have shown effects only at exposure levels very nearly lethal to the maternal animals.
Teratogenicity: This product is not reported to have teratogenic effects in humans. Human teratogenic data are available for Potassium Cyanide (a component of this product); these data were obtained during clinical studies on specific human tissues exposed to high doses of these compounds.
Reproductive Toxicity: This product is not reported to have adverse reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of Potassium Cyanide (a component of this product) indicate adverse reproductive effects.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURE INDICES: Currently, no Biological Exposure Indices (BEIs) are applicable to the components of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES SHOULD BE AIMED AT PREVENTING ANY RELEASE TO THE ENVIRONMENT.

ENVIRONMENTAL STABILITY: The components of this product will decompose into organic and inorganic compounds. The following environmental data are available for the components of this product:

POTASSIUM CYANIDE: Solubility: Soluble in 2 parts cold 1 part boiling water; 100 g/100 cc hot water above 176°C. With exposure to air Potassium Cyanide is slowly attacked by carbon dioxide and moisture. Decomposes rapidly in water.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be extremely harmful or fatal to contaminated plant and animal life if released into the environment. Refer to Section 11 (Toxicology Information) for information on this product's components effects on test animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product is extremely harmful or fatal to aquatic plant and animal life in bodies of water which has been contaminated with this product. Additional toxicity data are available for substances in this product, as follows:

SILVER: 0.1 ppm is toxic to bacteria and aquatic life. Discharge into marine waters should not exceed 1/20 of 96 hour LC_{50}, 0.25-0.025 mg/kg/day.

POTASSIUM CYANIDE: Concentration for fresh or salt water fish, 0.02 ppm CN. Highly toxic to all species of animal life. Produces HCN that is highly toxic by all routes. Freshwater should not exceed 1/20 of 96 hour LC_{50}. Marine waters 1/10 of 96 hour LC_{50}.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

EPA WASTE NUMBER: Depending on the nature of the wastes, the following EPA waste numbers may be applicable: D002, D003, F007 or F008, to wastes consisting only of this product.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS PER THE U.S. DEPARTMENT OF TRANSPORTATION (49 CFR 172.101)

PROPER SHIPPING NAME:	Corrosive liquids, toxic, n.o.s. (Potassium hydroxide, copper cyanide)
HAZARD CLASS NUMBER and DESCRIPTION:	8 (Corrosive Material)
UN IDENTIFICATION NUMBER:	UN 2922
PACKING GROUP:	III
DOT LABEL(S) REQUIRED:	Ground: LTD QTY; Air: Primary: Corrosive; Subsidiary: Toxic

NOTE: Limited quantity exceptions are applicable for this product if requirements in 40 CFR 173.54 (b), 2 are met. Under these exceptions, inner packagings must not be over 4.0 liters (1 gallon), net capacity for liquids, packed in strong outer packagings. Each package must not exceed 30 kg (66 lb) gross weight. Limited quantities which meet these requirements are excepted from labeling, unless offered or intended for transport by air. In addition, shipments of these limited quantities are not subject to Subpart F (Placarding) of Part 172. Packages must comply with Subpart B of Part 172.

NORTH AMERICAN EMERGENCY RESPONSE GUIDE NUMBER (1996): 154

MARINE POLLUTANT: Cyanide solutions are listed as Marine Pollutants by the Department of Transportation (49 CFR 172.101, Appendix B). Shipments by water must be marked according to 49 CFR 172.322.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Refer to above information for shipments to Canada.

UPS GUIDE FOR SHIPPING GROUND and AIR HAZARDOUS MATERIALS:

PROPER SHIPPING NAME:	Corrosive liquids, toxic, n.o.s. (Potassium hydroxide, Copper cyanide)
HAZARD CLASS NUMBER and DESCRIPTION:	8 (Corrosive Material)
UN IDENTIFICATION NUMBER:	UN 2922
PACKING GROUP:	III
DOT LABEL(S) REQUIRED:	Corrosive and Poison PGIII (Ground); Corrosive and DOT E8249 (Air)
AIR MAXIMUM NET QUANTITY:	5 Liters

NORTH AMERICAN EMERGENCY RESPONSE GUIDE NUMBER (1996): 154

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: The components of this product listed in Section 2 (Composition and Information on Ingredients) are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

COMPONENT	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Potassium Cyanide	Yes	Yes	No

U.S. SARA THRESHOLD PLANNING QUANTITY: Potassium Cyanide = 100 lb (45.4 kg)
U.S. CERCLA REPORTABLE QUANTITY (RQ): Potassium Cyanide = 10 lb (4.54 kg)
U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.
CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL or NDSL Inventory.
OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Cyanides.
California - Permissible Exposure Limits for Chemical Contaminants: Cyanide.
Florida - Substance List: Potassium Cyanide.
Illinois - Toxic Substance List: Cyanide, inorganic salts.
Kansas - Section 302/313 List: Potassium Cyanide.
Massachusetts - Substance List: List: Potassium Cyanide.
Michigan - Critical Materials Register: Cyanides.
Minnesota - List of Hazardous Substances: Cyanides.
Missouri- Employer Information/Toxic Substance List: Potassium Cyanide.
New Jersey - Right to Know Hazardous Substance List: Copper Cyanide, Potassium Cyanide.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: Copper Cyanide, Potassium Cyanide.
Pennsylvania - Hazardous Substance List: List: Potassium Cyanide.
Rhode Island - Hazardous Substance List: Cyanides, Potassium Cyanide.
Texas - Hazardous Substance List: No.
West Virginia - Hazardous Substance List: No.
Wisconsin - Toxic and Hazardous Substances: No.

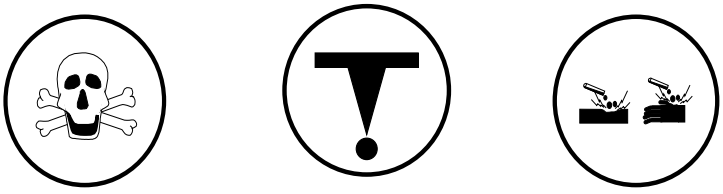
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 Lists.

ANSI LABELING (Z129.1): **DANGER!** MAY BE FATAL IF SWALLOWED. MAY BE FATAL IF ABSORBED THROUGH THE SKIN. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE SEVERE SKIN AND EYE IRRITATION AND TISSUE DAMAGE. Avoid contact with skin, eyes, and clothing. Avoid exposures to mists, spray or vapors. Wash thoroughly after handling. Use in well-ventilated area. Use gloves, safety goggles, face shield and appropriate body protection. **FIRST-AID**: In case of skin or eye contact, flush with water for 15 minutes. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If ingested, if the victim is conscious, induce vomiting until vomiting is clear. Get medical attention. **ANTIDOTE**: Always have on hand a cyanide first- aid kit (kit contains Amyl nitrite inhalation, 3% Sodium nitrite solution, 25% Sodium thiosulfate solution). Break a fresh amyl nitrite pearl in a cloth every 3 minutes and hold lightly under nose for 30 seconds every minute until intravenous nitrites are administered. Call a physician. **NOTE TO PHYSICIAN**: After amyl nitrite administration, inject intravenously 10 mL of a 3% solution of sodium nitrite at a rate no greater than 2.5 to 5 mL per minute. Follow directly with 50 mL of a 25% solution of sodium thiosulfate at the same rate by the same route. Keep patient under observation. If signs of poisoning persist or reappear, repeat nitrite and thiosulfate injections 1 hour later in one-half the original doses. Always check methemoglobinemia levels. If victim has difficulty breathing, is becoming confused and/or losing consciousness, administer amyl nitrite. **IN CASE OF FIRE**: Use water fog, dry chemical, or "alcohol" foam. **IN CASE OF SPILL**: Absorb with an inert material (i.e. polypads), then place in a suitable container. Flush area with water. Consult Material Safety Data Sheet before use.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL Inventory.
OTHER CANADIAN REGULATIONS: Not applicable.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this product are not on the CEPA Priorities Substances Lists
CANADIAN WHMIS SYMBOLS:

D1-B: Materials Causing Immediate and Serious Toxic Effects
D2-B: Materials Causing Other Toxic Effects/Toxic Material
E: Corrosive Material



16. OTHER INFORMATION

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Cohler Enterprises Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, Cohler Enterprises, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

FOR FURTHER INFORMATION: For matters pertaining to the health hazards, safety precautions, environmental compliance issues associated with this product, please contact ADVANCED CHEMICAL SAFETY by calling (858)874-5577 or via email at neal@chemical-safety.com

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DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

SECTION 2: CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching. **ACGIH** - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV -** Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level. Skin absorption effects must also be considered. **OSHA** - U.S. Occupational Safety and Health Administration. **PEL -** Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order. The **DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). **IDLH -** Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

SECTION 3: HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS): Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93◦C [100-200◦F]); **3** (Class IB and IC flammable liquids with flash points below 38◦C [100◦F]); **4** (Class IA flammable liquids with flash points below 23◦C [73◦F] and boiling points below 38◦C [100◦F]. Physical Hazard: **0** (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

SECTION 5: NATIONAL FIRE PROTECTION ASSOCIATION (NFPA): Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR: Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

SECTION 11: TOXICOLOGICAL INFORMATION: Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m^3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. A **mutagen** is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical that causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance that interferes in any way with the reproductive process. **Other Information: BEI** - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

SECTION 12: Ecological Information: EC is the effect concentration in water. **BCF** = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter. **TL_m** = median threshold limit; Coefficient of Oil/Water Distribution is represented by **log K_{ow}** or **log K_{oc}** and is used to assess a substance's behavior in the environment.

SECTION 13: RCRA is the Resource Conservation and Recovery Act.

SECTION 15: This section explains the impact of various laws and regulations on the material. **U.S.: EPA** is the U.S. Environmental Protection Agency. **DOT** is the U.S. Department of Transportation. **SARA** is the Superfund Amendments and Reauthorization Act. **TSCA** is the U.S. Toxic Substance Control Act. **CERCLA (or Superfund)** refers to the Comprehensive Environmental Response, Compensation, and Liability Act. Labeling is per the American National Standards Institute Standard: Hazardous Industrial Chemicals - Precautionary Labeling 2000 (**ANSI Z129.1**). **CANADA: CEPA** is the Canadian Environmental Protection Act. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **TC** is Transport Canada. **DSL/NDSL** are the Canadian Domestic/Non-Domestic Substances Lists.