SAFETY DATA SHEET

This Safety Data Sheet (SDS) complies with the requirements of the U.S. Federal Occupational Safety and Health Administration Hazard Communication Standard (29 CFR 1910.1200, as updated in 2012), the American National Standards Institute (Z400.1, 1998), and equivalent state Standards. It has also been developed in accordance with the Canadian Workplace Hazardous Materials Standard and the United Nations Globally Harmonized System of Classification of Chemicals, as well as European Union requirements under REACH (Registration, Evaluation, Authorization and Restriction of Chemical substances, per EC 1907/2006) and Directive 91/155/EC. Refer to Section 16 of this document for the definition of terms and abbreviations.

SECTION 1: IDENTIFICATION of the Substance/Mixture and of the Company/Undertaking

1.1 PRODUCT IDENTIFIER:

- PRODUCT NAME: **Pen Pals® Gold Plating Solutions**
- SYNONYMS: Trade Names are listed below:

- **14K Gold**
- **18K Gold**
- **24K Gold**
- **Green Gold**
- **Rose Gold**

- VOLUMES: 20 mL, 60 mL, 100 mL, 250 mL, 500 mL, and 1 L
- CHEMICAL NAME/CLASS: Inorganic solution.

1.2 RELEVANT IDENTIFIED USES OF THE MIXTURE OR USES ADVISED AGAINST

- IDENTIFIED USE: Jewelry Plating
- USES ADVISED AGAINST: None Specified

1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

- MANUFACTURER/ SUPPLIER: **COHLER ENTERPRISES, INC.**
- ADDRESS: 101 North Haven Street, Baltimore, MD 21224
- BUSINESS PHONE: 410-342-1400
- EMERGENCY PHONE: 1-800-424-9300 (CHEMTREC; 24 hours)
  +1-703-527-3887 (CHEMTREC, International and Maritime)

1.4 OTHER PERTINENT INFORMATION

- This product is used as part of metal finishing and polishing processes in relatively small volume (1 quart and less in size). This SDS has been developed to address safety concerns affecting small volume handling situations and those involving warehouses and other workplaces where large numbers of these items are stored or distributed.

SECTION 2: HAZARDS IDENTIFICATION

2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE:

REGULATION	CLASSIFICATION
OSHA HAZARD COMMUNICATION (GHS)	Skin corrosion (Category 2); Serious eye damage (Category 1); Acute Toxicity, Oral (Category 3); Acute Toxicity, Dermal (Category 3); Acute Toxicity, Inhalation (Category 4); Acute aquatic toxicity (Category 3)
REACH/CLP (GHS)	Skin corrosion (Category 2); Serious eye damage (Category 1); Acute Toxicity, Oral (Category 3); Acute Toxicity, Dermal (Category 3); Acute Toxicity, Inhalation (Category 4)
EU DIRECTIVES 67/548/EEC; 1999/45/EC	Corrosive. Toxic. Dangerous for the Environment [C, T, N]

SECTION 2: HAZARDS IDENTIFICATION (Continued)

2.2 LABEL ELEMENTS:

- OSHA/CLP – BASED ON GLOBALLY HARMONIZED SYSTEM

Symbol: To the right.
Signal Word: Danger.
Hazard statement(s)

- H301+H311 - Toxic if swallowed or in contact with skin.
- H315: Causes skin irritation.
- H318: Causes serious eye damage.
- H332 - Harmful if inhaled.
- H402 - Harmful to aquatic life.

Precautionary statement(s)

- P102: Keep out of reach of children.
- P261: Avoid breathing mist/ vapors/ spray.
- P264: Wash thoroughly after handling.
- P270: Do not eat, smoke or drink when using this product.
- P271: Use only in well-ventilated areas.
- P273: Avoid release to the environment.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P301+P310 +330: IF SWALLOWED: immediately call a POISON CENTER or doctor/physician Rinse mouth.
- P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340: IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P312 - Call a POISON CENTER/doctor/physician if you feel unwell
- P321 - Specific treatment (see Antidote)
- P363: Wash contaminated clothing before reuse.
- P405: Store locked up.
- P501 Dispose of contents/ container to an approved waste disposal plant; precious metal reclamation should be considered.

Antidote: If breathing is difficult or victim is unconscious, administer amyl nitrite. See Safety Data Sheet for full details.

- EC DIRECTIVE SYMBOLS, RISK AND SAFETY PHRASES

Symbol: Corrosive. Toxic. Dangerous for the Environment [C, T, N]

Risk Phrases: Toxic in contact with skin or if swallowed. Causes burns. Harmful to aquatic organisms, [R:24/25; 45;52]

Safety Phrases Keep locked-up and out of reach of children. *(This safety phrase may be omitted for preparations sold for industrial use only).* Avoid contact with skin and eyes. Do not breathe mist or vapors. Keep container tightly closed. Keep away from food, drink, animal foodstuffs. After contact with skin, wash thoroughly with plenty of water. In case of contact with eyes, rinse immediately with water and seek medical advice. Do not empty into drains. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).Use only in well-ventilated areas. This material and/or its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety datasheet. [S: (1&2); S23; S24/25; S7, S13 S28 S29, S36/27/39; S45; S51; S56; S61]

SECTION 2: HAZARDS IDENTIFICATION (Continued)

2.3 OTHER PERTINENT DATA ON CHEMICAL AND PHYSICAL HAZARDS:

- **EMERGENCY OVERVIEW:**

PHYSICAL DESCRIPTION: This product is light yellow with 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. Skin contact may cause severe irritation or tissue damage, especially upon prolonged exposure.

FIRE HAZARDS: This product is not reactive or flammable under normal conditions.

PHYSICALHAZARDS: If heated to decomposition, this solution may produce toxic vapors containing hydrogen cyanide and potassium compounds.

EVIRONMENTAL HAZARDS: This product may be harmful or fatal to contaminated terrestrial and aquatic life-forms.

- **HAZARDOUS MATERIALS IDENTIFICATION SYSTEM**

Health	**3**
Flammability	**0**
Physical Hazard	**0**
Protective Equipment	**C/J**

HMIS Personal Protective Equipment Rating: Occupational Use situations: **C -** Safety glasses and gloves, and body protection suitable to specific circumstances of use. **J -** If needed, safety goggles/respiratory protection should be added.

- **CANADIAN REGULATORY STATUS**
  - This product is classified as hazardous under Canadian Controlled Products regulations (SOR-88-66). It is classified as D1-A: Materials Causing Immediate and Serious Toxic Effects; D2-A: Materials Causing Other Toxic Effects/Toxic Material; E: Corrosive Material;
  - This SDS contains all the information required by the CPR.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1/3.2 SUBSTANCES/MIXTURES

COMPONENT	CAS NUMBER	EINECS #	EC Class/Risk Phrases	% (w/w)
Gold	7440-57-5	231-169-5	Not Established	1-2%
Potassium Cyanide	151-50-8	205-792-3	Not Established	5-10%
Potassium Hydroxide (formed in solution along with small amounts of Gold Cyanide Complex)	1310-58-3	215-181-3	Risk: C (Corrosive) R35: Causes severe burns.	< 1
Water and other components. Each of the other components is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens.)			Not Established	Balance

SECTION 4: FIRST AID MEASURES

4.1 DESCRIPTION OF FIRST AID MEASURES

Eyes: Flush with copious amounts of water for 15 minutes. "Roll" eyes during flush. Seek medical attention immediately. **Skin:** Flush area with warm, running water for 15 minutes. **Inhalation**: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. I**ngestion:** Contact a Poison Control Center or physician for instructions. If professional advice is not available, do not induce vomiting. 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.

SECTION 4: FIRST AID MEASURES (Continued)

4.2 MOST IMPORTANT ACUTE AND CHRONIC EXPOSURE SYMPTOMS

- **ACUTE:** The following sections describe acute symptoms by route of exposure.
  - **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 of such poisoning can include weakness, headache, confusion, nausea, vomiting, convulsions, coma and possibly death**.**
  - **Skin and 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), are sensitizers and can cause the development of allergy-like skin reactions (i.e. rashes and welts). If splashed into the eyes, the solution will cause immediate irritation. 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.
  - **Skin Absorbtion -** Potassium Cyanide (a components of this product) can be absorbed through the skin. Symptoms of such over-exposure will include those described for "Inhalation" and "Contact With Eyes or Skin". 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. The symptoms of "Cyanide Poisoning" are described under "Inhalation".
- **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.
- **TARGET ORGANS:** Skin, eyes, respiratory system, blood and metabolic enzymes.

4.3 INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

- **RECOMMENDATIONS TO PHYSICIANS**: Treat symptoms and eliminate exposure.
- **CYANIDE EXPOSURE PREPAREDNESS:** 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. The following procedure is recommended:
  - Crush one pearl of amyl nitrite onto a cloth and hold to the victim's nose for 15 seconds, 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, begin 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.
  - Physicians should refer to Section 11 (Toxicology Information) for additional information.
- **MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** Over-exposure to this product may aggravate pre-existing respiratory, blood, and skin conditions.

SECTION 5: FIREFIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

- **RECOMMENDED FIRE EXTINGUISHING MEDIA:** Water Spray, Water Jet, Dry Powder, Foam, Carbon Dioxide, Halon, or any other.
- **UNSUITABLE FIRE EXTINGUISHING MEDIA:** None known.

SECTION 5: FIREFIGHTING MEASURES (Continued)

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

NFPA RATING

NFPA FLAMMABILITY CLASSIFICATION: Not flammable.

UNUSUAL HAZARDS IN FIRE SITUATIONS: 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 (e.g., hydrogen cyanide and potassium compounds).

Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

5.3 ADVICE FOR FIREFIGHTERS

Wear Self Contained Breathing Apparatus and full protective equipment for fire response. Move containers from fire area if it can be done without risk to personnel. Otherwise, use water spray to keep fire-exposed containers cool. Contaminated equipment should be rinsed with a 10% bleach solution, then thoroughly rinsed with water, before returning to service.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, AND EMERGENCY PROCEDURES

- **RESPONSE TO INCIDENTAL RELEASES:** Personnel who have received basic chemical safety training can generally handle small-scale releases (e.g., under 1 gallon). For small releases, the minimum Personal Protective Equipment should be rubber gloves and rubber apron, splash goggles or safety glasses. In the event a release situation during which there is a potential for inhalation of mists or sprays, respiratory protection should be worn. If necessary, use air-purifying respirator with High-efficiency particulate filter cartridges with face-shield. Use caution during clean-up; contaminated floors and items may be slippery.
- **RESPONSE TO NON-INCIDENTAL RELEASES:** If oxygen levels are below 19.5% or are unknown, or if the release is deemed non-incidental, clear the affected area, protect people, and respond with trained personnel. Minimum Personal Protective Equipment 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 (SCBA). SCBA should be worn when oxygen levels are below 19.5% or are unknown. .
- **RESPONSE PROCEDURES FOR ANY RELEASE**: Absorb spilled liquid with polypads or other suitable absorbent materials. Treat any potentially contaminated item or surface with10 percent bleach solution followed by a triple rinse with water..

6.2 ENVIRONMENTAL PRECAUTIONS

- Avoid response actions that can cause a release of a significant amount of the substance (1 liter or more) into the environment. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP

- **SPILL RESPONSE EQUIPMENT:** Polypad or other absorbent material. 10 percent bleach solution.

6.4 REFERENCES TO OTHER SECTIONS

- **SECTION 8:** For exposure levels and detailed personal protective equipment recommendations.
- **SECTION 13:** For waste handling guidelines.

SECTION 7: HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

- **HYGIENE PRACTICES:** Keep out of reach of children**.** Follow good chemical hygiene practices. Do not smoke, drink, eat, or apply cosmetics in the chemical use area. Avoid inhalation of vapors, mists and sprays. Use in well-ventilated area. Avoid contact with skin or eyes. Remove contaminated clothing promptly. Clean up spilled product immediately. Medical treatment kits for cyanide poisoning should be conveniently located for easy access.
- **HANDLING RECOMMENDATIONS:** Employees must be appropriately trained to use this product safely as needed. Keep containers closed when not in use.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMAPTIBILITIES

- **STORAGE RECOMMENDATIONS:** Ensure all containers are correctly labeled. Store containers away from direct sunlight, sources of intense heat, or where freezing is possible. Store this product away from incompatible chemicals (See Section 10, Stability and Reactivity). Empty containers may contain residual liquid; therefore, empty containers should be handled with care. Material should be stored in secondary containers, or in a diked area, as appropriate. Storage and use areas should be covered with impervious materials. Storage areas should be made of corrosion-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.

7.3 SPECIFIC END USES

- **RECOMMENDATIONS:** Place product away from children and animals.
- **INDUSTRIAL-SECTOR SPECIFIC SOLUTIONS:** PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT -- Follow practices indicated in Section 6 (Accidental Release Measures).

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

- **U.S. NATIONAL EXPOSURE LIMITS:**

COMPONENT	ACGIH TLV	OSHA PEL	NIOSH REL	OTHER
Potassium Cyanide (Cyanides, as CN)	5 mg/m^3, Ceiling (as Cyanide Salts); Skin	TWA - 5 mg/m^3; Skin	NE	NE
Gold	NE	NE	NE	NE
Potassium Hydroxide	2 mg/m^3, Ceiling	TWA - 2 mg/m^3	2 mg/m^3, Ceiling	NE

- **INTERNATIONAL EXPOSURE LIMITS:**

COMPONENT	Federal Republic of Germany (DFG) Maximum Concentration Values in the Workplace (MAKs)	OTHER
Potassium Cyanide (Cyanides, as CN)	2 mg/m^3, Ceiling, Skin (Inhalable Fraction of Aerosol)	**United Kingdom Workplace Exposure limits:** TWA = 5mg/m^3, Skin
Gold	NE	NE
Potassium Hydroxide	NE	**United Kingdom Workplace Exposure limits:** STEL = 2mg/m^3

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION (Continued)

- **BIOLOGICAL OCCUPATIONAL EXPOSURE LIMITS:** No Biological Exposure Indices (BEIs) are available for the components of this product.
- **DERIVED NO EFFECT LEVEL (DNEL):** Not established.
- **PREDICTED NO EFFECT CONCENTRATION (PNEC):** Not established.

8.2 EXPOSURE CONTROLS

- **ENGINEERING CONTROLS:** Use this product in well-ventilated environment. Safety showers, eye wash stations, and hand-washing equipment should be available.
- **RESPIRATORY PROTECTION:** None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control mists. Maintain airborne contaminate concentrations below guidelines listed in Section 3 (Composition and Information on Ingredients). If respiratory protection is needed, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EC member states. The following NIOSH Respiratory Guideline Protection Equipment recommendations for Potassium Cyanide:
    - **UP TO 25 mg/m :** 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
- **HAND PROTECTION:** Rubber or neoprene gloves should be used. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this SDS. If necessary, refer to U.S. OSHA 29 CFR 1910.138, appropriate Standards of Canada, or appropriate Standards of the European Economic Community.
- **EYE PROTECTION:** Splash goggles or safety glasses. If more than 1 gallon of this product is to be used, a face shield should be considered. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian Standards, or the European Standard EN166.
- **BODY PROTECTION:** Use a body protection appropriate to task (e.g., lab coat, coveralls, or apron). Care should be taken to select protection for potentially exposed areas when splashes, sprays, or prolonged exposure could occur in occupational settings.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

(a) APPEARANCE: Light yellow solution.
(b) ODOR: Slight, almond-like odor.
(c) ODOR THRESHOLD: Not determined.
(d) pH: > 12.10.
(e) MELTING POINT/FREEZING POINT: Not available.
(f) INITIAL BOILING POINT AND BOILING RANGE: Not available.
(g) FLASH POINT: Not applicable.
(h) EVAPORATION RATE (water=1): Approximately 1.0.
(i) FLAMMABILITY: Not flammable.
(j) UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS: Not applicable.
(k) VAPOR PRESSURE (mmHg @ 20˚C): Not determined.
(l) VAPOR DENSITY: Not determined.
(m) RELATIVE DENSITY (water=1): Approximately 1.0
(n) SOLUBILITY: Soluble.
(o) PARTITION COEFFICIENT: N-OCTANOL/WATER: Not determined.
(p) AUTO-IGNITION TEMPERATURE: Not applicable.
(q) DECOMPOSITION TEMPERATURE: Not determined.
(r) VISCOSITY: Not determined.
(s) EXPLOSIVE PROPERTIES: Not applicable.
(t) OXIDIZING PROPERTIES: Not an oxidizer.

9.2 OTHER INFORMATION

- **VOC (less water & exempt):** Not applicable.
- **WEIGHT% VOC:** Not applicable.

SECTION 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

- Not reactive under typical conditions of use or handling; contact with water can generate some amount of heat.

10.2 CHEMICAL STABILITY

- Normally stable under standard temperatures and pressures.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

- This product is not self-reactive or air-reactive.
- This product will not undergo hazardous polymerization**.**

10.4 CONDITIONS TO AVOID

- Avoid contact with incompatible chemicals.

10.5 INCOMPATIBLE MATERIALS

- This product is not compatible with oxidizers or strong acids. Contact of this product with acids or acid salts can release toxic hydrogen cyanide gas.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

- The products of thermal decomposition include hydrogen cyanide, other cyanide compounds, and substances containing potassium and gold.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

- **ACUTE TOXICITY:**
  - **TOXICOLOGY DATA:** The following toxicology data are available for the listed components of this product.

    POTASSIUM CYANIDE:
    LDLO Oral – Human - 2.857 mg/kg
    LD_{50} Oral – mouse - 8.5 mg/kg
    LD_{50} Oral – rabbit - 5 mg/kg
    LD_{50} Oral – rat - 6 mg/kg
  - **DEGREE OF IRRITATION:** Moderate to severe especially after prolonged exposure.
  - **SENSITIZATION:** Potassium Cyanide (a component of this product) is a sensitizer and can cause allergy-like skin reactions upon repeated or prolonged exposure.**).**
  - **REVIEW OF ACUTE SYMPTOMS AND EFFECTS:** See Section 2 (Hazards Information) and Section 4 (First-Aid Measures) for further details.
    - **EYES:** May cause moderate to severe eye irritation and chemical burns.
    - **SKIN:** May cause moderate to severe skin irritation, and chemical burns. Repeated exposure to this material can result in absorption through skin causing significant health hazard.
    - **INHALATION:** Mists or vapors of this product can cause nasal irritation, sore throat, choking, coughing, and breathing difficulties. .
    - **INGESTION:** Although not anticipated to be a significant route of occupational over-exposures, ingestion of this product may be fatal.
    - **NOTE:** This product can cause cyanide poisoning by all routes of exposure.

SECTION 11: TOXICOLOGICAL INFORMATION (Continued)

- **CHRONIC TOXICITY:**
  - **CARCINOGENICITY STATUS:** The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be, or suspected to be, a carcinogen by the listed agency.

CHEMICAL	IARC	NTP	NIOSH	OSHA	OTHER
Potassium Cyanide (Cyanides, as CN)	NO	NO	NO	NO	NO
Gold	NO	NO	NO	NO	NO
Potassium Hydroxide	NO	NO	NO	NO	NO

  - **REPRODUCTIVE TOXICITY INFORMATION: 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.
  - **MUTAGENIC EFFECTS:** 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.
  - **SPECIFIC TARGET ORGAN TOXICITY – SINGLE EXPOSURE:** Not classified.
  - **SPECIFIC TARGET ORGAN TOXICITY – REPEATED EXPOSURE:** Not classified.

- **OTHER INFORMATION**
  - **TOXICOLOGICALLY SYNERGISTIC PRODUCTS:** None known.
  - **ADDITIONAL TOXICOLOGY:** None known.

SECTION 12: ECOLOGICAL INFORMATION

12.1 TOXICITY

- Based on available data, this product is anticipated to be harmful or fatal to contaminated terrestrial plants or animals.
- Based on available data, this product is anticipated to be harmful or fatal to contaminated aquatic plants or animals. It has the potential to significantly raise the pH of the surrounding local water systems.
- The following aquatic toxicity data are available for components of this product.

POTASSIUM CYANIDE:
LC_{50} (*Salmo salar* atlantic salmon) 24 hours = 0.08-068 mg/L
EC_0 (*Salmo gairdneria* rainbow trout) 40 minutes = 0.001 mg/L
TLm (bluegill) 48 hours = 0.16 ppm
TLm (zebrafish) 48 hours = 0.49 ppm/L

12.2 PERSISTENCE AND DEGRADABILITY

- When released into the soil, the components of this product are expected to dissipate in soils via oxidation, or otherwise chemically degrade or photo-decompose via solar radiation.

SECTION 12: ECOLOGICAL INFORMATION (Continuous)

12.3 BIOACCUMULATIVE POTENTIAL

- The following components of this product are not reported to bioaccumlate significantly.

12.4 MOBILITY IN SOIL

- It is to be expected this product will have small mobility in soil. Some of the components may get into the soil and, ultimately, the ground water. Product spreads on the water surface.

12.5 RESULTS OF PBTand vPvB ASSESSMENT

- No data are available.

12.6 OTHER ADVERSE EFFECTS

- ENDROCRINE DISRUPTOR INFORMATION: No component is reported to be an endocrine disruptor.

SECTION 13: DISPOSAL CONSIDERATION

13.1 WASTE TREATMENT METHODS

- **WASTE HANDLING RECOMMENDATIONS:** Prepare, transport, treat, store, and dispose of waste product according to all applicable local, U.S. State and U.S. Federal regulations, the applicable Canadian standards, or the appropriate standards of the nations of the European Community.
- **PRECIOUS METAL RECLAMATION:** Users of the product may wish to utilize precious metal reclamation services for final disposition of wastes.

13.2 DISPOSAL CONSIDERATIONS

- **EPA RCRA WASTE CODE:** D002; P030 **EUROPEAN WASTE CODE:** 11 03 01*

SECTION 14: TRANSPORT INFORMATION

14.1,2,3,4: DANGEROUS GOODS BASIC DESCRIPTION AND OTHER TRANSPORT INFORMATION

- **DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIALS SHIPPING REGULATIONS:**

UN/NA Number	Proper Shipping Name	Packing Group	Hazard Class	Label	North American Emergency Response Guide #	Marine Pollutant Status
UN2922	Corrosive liquids, toxic, n.o.s. (Potassium Hydroxide, Gold Cyanide)	III	8, 6.1	See Other Relevant Information	154	Cyanide compounds are listed specifically as a DOT Marine Pollutant.

  - **OTHER RELEVANT INFORMATION:**
    - **Small Quantity Exception (49 CFR 173.4, 4a)**: Small quantities of Class 8 (and 6.1 PG III) materials are not subjected to other requirements of the Hazardous Materials Regulations (Subchapter C) when the maximum quantity per inner receptacle is limited to 30 mL (liquids). Refer to 49 CFR 173.4 for specific information in packaging small quantity materials.
    - **Limited Quantity Exceptions [49 CFR 173.154(b)(2)]**: Limited quantities for Class 8, Packing Group III materials have inner packagings not over 5.0 L [1.3 gal] (liquids) net capacity each, packed in strong outer packaging.
- **CANADIAN TRANSPORTATION INFORMATION**: This product is regulated by Transport Canada as dangerous goods under Canadian transportation standards. Refer to above information.

SECTION 14: TRANSPORT INFORMATION

- **IATA DESIGNATION**: This product is regulated as dangerous goods by the International Air Transport Association. Use the following information:

Proper Shipping Name	Passenger and Cargo Aircraft				Cargo Aircraft Only	
	Limited Quantity		Packing Instruction	Max. Qty per PKG	Packing Instruction	Max. Qty per PKG
	Packing Instruction	Max. Qty per PKG				
Corrosive liquid, toxic, n.o.s. (Potassium Hydroxide, Gold Cyanide complex)	Y841	1.0L	852	5L	856	60L

- **EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):** This product is to be dangerous goods. Use the above information for transport classification.

14.5: ENVIRONMENTAL HAZARDS

- None described, as related to transportation.

14.6: SPECIAL PRECAUTIONS FOR USERS

- Not applicable.

14.7: TRANSPORT IN BULK

- Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1: SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE SUBSTANCE OR MIXTURE.

- **OTHER IMPORTANT U.S. REGULATIONS**
  - **U .S. SARA THRESHOLD PLANNING QUANTITY**: Potassium Cyanide = 100 lb (45.4 kg)
  - **U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21):** ACUTE: Yes; CHRONIC: Yes; FIRE: No; REACTIVE: No; SUDDEN RELEASE: No
  - **U.S. CERCLA REPORTABLE QUANTITY (RQ):** Potassium Cyanide = 100 lb (45.4 kg).
  - **U.S. TSCA INVENTORY STATUS:** All components of this product are listed on the TSCA Inventory.
  - **US SARA 313:** This material contains cyanide compounds (Potassium Cyanide) that are subject to the requirements of SARA Title III and 40 CFR Part 373.
  - **CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) STATUS:** Not applicable.
- **INTERNATIONAL REGULATIONS**
  - **CANADIAN DSL/NDSL INVENTORY STATUS:** The listed components of this product are on the DSL/NDSL Inventory.
  - **CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS:** The components of this product are not on the CEPA Priorities Substances Lists.
  - **GERMAN WATER HAZARD CLASSIFICATION:** 2 (moderate hazard to waters)

15.2: CHEMICAL SAFETY ASSESSMENT.

- No information available.

SECTION 16: OTHER INFORMATION

16.1: INDICATION OF CHANGE.

- **CHANGE INDICATED:** Update of OSHA Hazard Communication Standard (29 CFR 1910.1200).
- **ORIGINAL DATE OF ISSUE:** May 27, 1999
- **DATES OF UPDATES:** May 1, 2005; July 15, 2014

16.2: ABBREVIATIONS AND ACRONYMS.

ALL SECTIONS: OSHA: U.S. Federal Occupational Safety and Health Administration. WHMIS: Canadian Workplace Hazardous Materials Standard. GHS: Globally Harmonized System of Classification of Chemical Substances. REACH: European Union regulation, Registration, Evaluation, Authorization and Restriction of Chemical substances.

SECTION 2: CAS Number: Chemical Abstract Service Number, which is used by the American chemical Society to uniquely identify a chemical. EINECS: European Inventory of Existing Commercial Substances.

SECTION 3: HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATING: This is a rating system used by industry to summarize physical and health hazards to chemical users and was originally developed by the National Paint and Coating Association. 0 = No Significant Hazard. 1 = Slight Hazard. 2 = Moderate Hazard. 3 = Severe Hazard. 4 = Extreme Hazard.

SECTION 5: NFPA: National Fire Protection Association. NFPA FLAMMABILITY CLASSIFICATION: The NFPA uses the flash point (Fl.P.) and boiling point (BP) to classify flammable or combustible liquids. Class IA: Fl.P. below 73°F and BP below 100°F. Class IB: Fl.P. below 73°F and BP at or above 100°F. Class IC: :Fl.P. at or above 73°F and BP at or above 100°F. Class II: : Fl.P. at or above 100°F and below 140°F. Class IIIA: Fl.P. at or above 140°F and below 200°F. Class IIIB: Fl.P. at or above 200°F. NFPA HAZARDOUS MATERIALS RATING: This is a rating system used to summarize physical and health hazards to firefighters. 0 = No Significant Hazard. 1 = Slight Hazard. 2 = Moderate Hazard. 3 = Severe Hazard. 4 = Extreme Hazard.

SECTION 8: NE:Not established. ACGIH: American Conference of Government Industrial Hygienists; TWA: Time-Weighted Average (over an 8-hour work day); STEL: Short-Term Exposure Limit (15 minute average, no more than 4-times daily and each exposure separated by one-hour minimally); C: Ceiling Limit (concentration not to be exceeded in a work environment). PEL: Permissible Exposure Limit. NIOSH: National Institute of Occupational Safety and Health; REL: Recommended Exposure Limit; IDLH: Immediately Dangerous to Life and Health Concentrations. *Note*: In July 1992, a court ruling vacated the more protective PELs set by OSHA in 1989. Because OSHA may enforce the more protective levels under the "general duty clause", both the current and vacated levels are presented in this document. ppm: Parts per Million. mg/m^3: Milligrams per cubic meter. mppcf: Millions of Particles per Cubic Foot. BEI: Biological Exposure Limit. EL: Exposure Limit (United Kingdom). Federal Republic of Germany (DFG) Maximum Concentration Values in the Workplace (MAKs)

SECTION 9: pH: Scale (0 to 14) used to rate the acidity or alkalinity of aqueous solutions. For example, a pH value of 0 indicates a strongly acidic solution, pH of 7 indicates a neutral solution, and a pH value of 14 indicates an extremely basic solution. FLASH POINT: Temperature at which a liquid generates enough flammable vapors so that ignition may occur. AUTOIGNITION TEMPERATURE: Temperature at which spontaneous ignition occurs. LOWER EXPLOSIVE LIMIT (LEL): The minimal concentration of flammable vapors in air which will sustain ignition. UPPER EXPLOSIVE LIMIT (UEL): The maximum concentration of flammable vapors in air which will sustain ignition.≈: Approximately symbol.

SECTION 11: CARCINOGENICITY STATUS: NTP: National Toxicology Program. IARC: International Agency for Research on Cancer. REPRODUCTIVE TOXICITY INFORMATION: Mutagen: Substance capable of causing chromosomal damage to cells. Embryotoxin: Substance capable of damaging the developing embryo in an overexposed female. Teratogen: Substance capable of damaging the developing fetus in an overexposed female. Reproductive toxin: Substance capable of adversely affecting male or female reproductive organs or functions. TOXICOLOGY DATA: LD*xx*or LC*xx*: The Lethal Dose or Lethal Concentration of a substance which will be fatal to a given percentage (*xx*) of exposed test animals by the designate route of administration. This value is used to access the toxicity of chemical substances to humans. TD*xx*or TC*xx*: The Toxic Dose or Toxic Concentration of a substance which will cause an adverse effect to a given percentage (*xx*) of exposed test animals by the designate route of administration.

SECTION 12: TLm – Median Tolerance Limit

SECTION 13: RCRA: Resource Conservation and Recovery Act. The regulations promulgated under this act under Act are found in 40 CFR, Sections 260 ff, and define the requirements of hazardous waste generation, transport, treatment, storage, and disposal. EPA RCRA Waste Codes: Defined in 40 CFR Section 261.

SECTION 15: CERCLA: Comprehensive Environmental Response Compensation and Liability Act (a.k.a. "Superfund") and SARA: (Superfund Amendment and Reauthorization Act). The regulations promulgated under this Act are located under 40 CFR 300 ff. and provide "community right-to-know" requirements. DSL/NDSL: Canadian Domestic Substances and Non-Domestic Substances Lists.

16.3: KEY LITERATURE REFERENCES AND SOURCES FOR DATA

- SAFETY DATA SHEETS FOR COMPONENT PRODUCTS.
- Regulations (EC) No 1907/2006, 1272/2008 & 453/2010 of the European Parliament and of the Council.
- Federal OSHA Hazard Communication Standard: 29 CFR 1910.1200
- SAX – Dangerous Properties of Industrial Materials
- RTECS – Registry of Effects of Toxic Chemicals
- ESIS -European Chemical Substances Information System http://esis.jrc.ec.europa.eu/

16.4: CLASSIFICATION AND PROCEDURE USED TO DERIVE THE CLASSIFICATIONS FOR MIXTURES

- **CLASSIFICATION**: Section 2 (Hazards Information) provides all relevant classification information used for this product. The assignments were based on data available for the component products, calculations, expert judgment, and weight of evidence.