

Material Safety Data Sheet

Section 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Revision Date: August 29, 2003

Product Name: Plating Solution, Gold (OROBUSH 999)
Product Number: 1oz: 115-3821
4oz: 115-3824

DISTRIBUTOR: Circuit Technology Center
45 Research Drive, Haverhill, MA 01832-1293
Phone: 978-374-5000, FAX: 978-372-5700

Emergency Response 24-Hour Telephone: **CHEMTREC** United States: (800) 424-9300
International: (703) 527-3887 (collect)

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Section 2. COMPOSITION, INFORMATION OR INGREDIENTS

CHEMICAL	C.A.S. Number	Weight %
Potassium Aurocyanide KAu(CN) ₂	554-07-4	8-9%
Cobalt Complex C ₁₀ H ₁₂ CoN ₂ O ₈	14931-83-0	1.06
Nickel Complex C ₆ H ₆ NiNO ₆ H	3333-67-3	0.07

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200):

	Exposure Limits 8 Hours TWA (PPM)	
	OSHA PEL	ACGIH TLV
Potassium Aurocyanide KAu(CN) ₂	NA	5mg/M3
Cobalt Complex C ₁₀ H ₁₂ CoN ₂ O ₈	NA	0.05mg Co ⁺² /M3
Nickel Complex C ₆ H ₆ NiNO ₆ H	NA	0.05mg Ni ⁺² /M3

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Section 3. HAZARD IDENTIFICATION

Emergency Overview:

Potential Health Effects:

INHALATION: Weakness, dizziness, headache, vomiting, unconscious and death.
EYES: "Cyanide Rash" - itching, macular, papular and vesicular eruptions. There are often secondary infections.
SKIN: "Cyanide Rash" - itching, macular, papular and vesicular eruptions. There are often secondary infections.
INGESTION: May cause death or permanent injury from small quantities. (If detected early: vomiting or unconsciousness).

ACUTE HEALTH EFFECTS: Local: Irritant that causes readily reversible changes which disappear after end of exposure.

Systemic: Ingestion or inhalation may cause death or permanent injury after a very short exposure to small quantities.

CHRONIC HEALTH EFFECTS: Local: Irritant that may cause reversible and irreversible changes; but not severe enough to cause death or permanent injury.

Systemic: Ingestion or inhalation can cause readily reversible changes which disappear after end of exposure.

This product contains material known to the state of California to cause cancer.

The American Conference of Governmental Industrial Hygienists has classified nickel compounds as Type A1 Carcinogens.

Section 4. FIRST AID MEASURES

INHALATION: Treat 5 times at 15 second intervals with amyl nitrite broken in cloth. Artificial respiration if necessary. Call a physician.
EYE CONTACT: Flush eyes with water for (15 minutes or longer). Call a physician.
SKIN CONTACT: Wash thoroughly with soap and water. Call a physician.
INGESTION: If conscious, give emetic (1 tablespoon salt to a glass of warm water). Repeat until vomit fluid is clear. Call a physician.

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Section 5. FIRE-FIGHTING MEASURES

Flash Point & Method: NA
Flammable Limits: LEL: NA UEL: NA
Autoignition Temperature: NA
GENERAL HAZARD: Do not let fire-fighting water run-off enter sewer which may be acidic and release flammable, poisonous hydrogen cyanide (HCN) gas.
FIRE FIGHTING INSTRUCTIONS: Full protective gear with a NIOSH/MSHA approved, self-contained breathing apparatus and protective gear if fully involved in a fire.
HAZARDOUS COMBUSTION PROD.: NA
FLAMMABLE PROPERTIES: Material will not burn.
EXTINGUISHING MEDIA: Use media appropriate for the surrounding fire. Do not use a carbon dioxide extinguisher.

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Section 6. ACCIDENTAL RELEASE MEASURES

LAND SPILL: Collect and send to Circuit Repair Corporation for refining - contains gold. Treat as complexed cyanide.
NEUTRALIZING AGENT: NA

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Section 7. HANDLING AND STORAGE

STORAGE TEMPERATURE: 55-85°F
STORAGE PRESSURE: Atmospheric
GENERAL: Store in a cool, dry place away from strong acids and food products.

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Section 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls:
(X) Local Exhaust ventilation is required.
() Mechanical ventilation recommended.
() Use explosion proof ventilation equipment.
() Do not use in confined spaces without mechanical ventilation equipment.
See section 2 for component exposure guidelines.

Personal Protection: Wash thoroughly before eating or smoking.
RESPIRATOR: Optional - NIOSH/MSHA approved respirator in a major spill.
HAND PROTECTION: (X) Protective Gloves Recommended (Rubber)
EYE PROTECTION: (Use one of the following)
(X) Safety Glasses (X) Chemical Goggles
OTHER RECOMMEND.: (X) Rubber Apron

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Section 9. PHYSICAL AND CHEMICAL PROPERTIES

Density.....	1.056 g/cm3	pH.....	NA
Boiling Point.....	NA	% Volatile By Volume.....	NA
Freezing Point.....	NA	% Solids.....	NA
Vapor Density (Air = 1).....	NA	Evaporation Rate (Butyl Acetate = 1).....	NA
Solubility in Water.....	Very Soluble	Viscosity.....	NA
Molecular Weight.....	NA	Physical State.....	Liquid
Non-Exempt VOC (g/L).....	NA	Odor.....	None
Appearance: Purple solution		Vapor Pressure(mmHg).....	NA

Section 10. STABILITY AND REACTIVITY

GENERAL: Stable.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID: Do not mix with strong acids, acid fumes or steam.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Hydrogen cyanide.

HAZARDOUS POLYMERIZATION: Will not occur.

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Section 11. TOXICOLOGICAL INFORMATION

RESULTS OF COMPONENT TOXICITY TEST PERFORMED: Information not available.

HUMAN EXPERIENCE: Information not available.

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Section 12. ECOLOGICAL INFORMATION

FURTHER INFORMATION: Information not available.

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Section 13. DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 Classification:

Federal, State, and Local laws governing disposal of materials can differ. Ensure proper disposal compliance with proper authorities before disposal.

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Section 14. TRANSPORT INFORMATION

DOT, IATA, ICAO, and IMO Description:

Basic Description: Gold Plating Solution

Proper Shipping Name: Toxic Liquid Inorganic, N.O.S. (Potassium Metallic Cyanide Mixture)

Hazard Class: 6.1

Packaging Group: II

UN Number: UN 3287

Label Requirements: DOT-E-8249

Max. Shippable Qty.: 5 liters for Air, (No ground limitations)

Packaging: Meets Performance Oriented Packaging Requirements

Reportable Quantity (RQ): NA

1996 NAERG Guide#: NA

Limitations: NA

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Section 15. REGULATORY INFORMATION

UNITED STATES FEDERAL REGULATIONS:

MSDS complies with OSHA's Hazard Communication Rule, 29 CFR 1910.1200.

CERCLA/SUPERFUND, 40 CFR 117, 302:
 --- None of the chemicals are Superfund hazards ---

SARA SUPERFUND AND REAUTHORIZATION ACT OF 1986 TITLE III Sections 302, 311, 312 and 313:
 Section 302 - Extremely hazardous substances (40 CFR 355)
 --- None of the chemicals are Section 302 hazards ---

- Section 311/312 - Material Safety Data Sheet Requirements (40 CFR 370)
- () By our hazard evaluation, this product is non-hazardous
 - (X) By our hazard evaluation, this product is hazardous. It should be reported under the following EPA hazard:
 - (X) Immediate (acute) health hazard
 - (X) Delayed (chronic) chronic health hazard
 - () Sudden release of pressure hazard
 - () Reactive Hazard

Section 313 - List of Toxic Chemicals (40 CFC 372)

This product contains the following chemicals (at levels of 1% or greater) which are found on the 313 list of Toxic Chemicals

<u>Toxic Chemical</u>	<u>C.A.S. Number</u>	<u>Weight %</u>
Potassium Aurocyanide KAu(CN) ₂	554-07-4	8-9%
Cobalt Complex C ₁₀ H ₁₂ CoN ₂ O ₈	14931-83-0	1.06

TOXIC SUBSTANCE CONTROL ACT (TSCA): All substances are TSCA Listed.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA 40 CFR 261) Subpart C&D:
Refer to Section 11. for RCRA classification.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15
(FORMERLY SECTION 307), 40 CFR 116 (FORMERLY SECTION 311)

This product contains the following chemicals which are listed:

<u>CHEMICAL</u>	<u>C.A.S. Number</u>	<u>Weight %</u>
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CLEAN AIR ACT: --- No Information ---

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

This product contains the following ingredients which appear on the California proposition 65 list: **CHEMI-**

<u>CAL</u>	<u>C.A.S. Number</u>	<u>Weight %</u>
Nickel Complex C ₆ H ₆ NiNO ₆ H	3333-67-3	0.07

INTERNATIONAL REGULATIONS:

CANADA WHIMS: NA
EUROPE EINECS NUMBERS: NA

For purposes of the New Jersey Right to Know Law, the contents are partially unknown.

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Section 16. OTHER INFORMATION

LABEL INFORMATION:

European risk and Safety Phrases: NA
European Symbols Needed: NA
Canadian WHIMS Symbols: NA

NFPA HAZARD RATING:

(3) Flammability (0) Health (1) Reactivity (B) Personal Protection

REVISION DATES, SECTIONS, REVISED BY:

01-JANUARY-00, J. FORBES

ABBREVIATIONS USED IN THIS DOCUMENT:

NE - Not Established, NA - Not Applicable/Not Available, NIF - No Information Found

REFERENCES:

Code of Federal Regulations (CFR)
The Sigma-Aldrich Library of Regulatory and Safety Data
Chemical Guide and OSHA Hazard Communication Standard
Various Federal, State & Local Regulations

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