



RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION
TUBE DEPT. STANDARDIZING
HARRISON, N. J. LANCASTER, PA.

DATE Nov.29, 1949 PAGE 1
LLL STANDARDIZING
NOTICE 34-36-60B
SUPERSEDED DATE

SUBJECT CYANIDE COPPER STRIKE
Process Specification

(Formerly included under S.N. 34-36-60)

This specification covers the cyanide copper strike process using DuPont "Coppralyte" Plating Salts, Potassium Formulation (formerly Potassium High-Speed Copper RH-661).

(See S.N. 34-36-60 for cyanide copper plating process specifications.)

1. EQUIPMENT

- a. Tank - Koroseal lined steel or Pyrex glass.
- b. Heater - Stainless steel steam coil, hot plate, or steel immersion heater.
- c. Temperature controls - Automatic.
- d. Agitator - None.
- e. Filter - When necessary.
- f. Exhaust - Exhaust required.
- g. Power supply - D-C from rectifier or generator.
- h. Contacts - Copper anode and cathode bars; case hardened steel anode hangers.
- i. Electrical instruments - Ammeter, voltmeter, and rheostat.

2. MATERIALS

- C601 Coppralyte Plating Salts, Potassium Formulation.
- C164 Copper Anodes.
- - Case-Hardened Steel Anodes.
- P64 Potassium Hydroxide, Technical.
- P60 Potassium Cyanide, Technical.
- C167 Cuprous Cyanide.
- W60 Deionized Water (or W7E Distilled Water).
- - Lime, Unslaked.
- - Sulfur.



CYANIDE SAFETY PRECAUTIONS: See 33-2-13A.
POTASSIUM HYDROXIDE SAFETY PRECAUTIONS: See 33-2-8A.

3. PREPARATION OF SOLUTION

- a. Composition: Plating salts - - - - - 6 oz./gal.
- Potassium cyanide - - - - - 1 oz./gal.
- Potassium hydroxide - - - - - 4 oz./gal.

b. Procedure:

- (1) Fill the tank two-thirds full with deionized or distilled water and dissolve required amount of potassium hydroxide and potassium cyanide with temperature of water not exceeding 51°C. (125°F.).
- (2) Dissolve required amount of plating salts.
- (3) Adjust solution to proper level.
- (4) Heat to operating temperature and filter.

4. SOLUTION OPERATION & CONTROL

a. Limits:	Preferred	Limits
	<u>per gal.</u>	<u>per gal.</u>
Copper as metal	1.4 oz.	1.1-1.7 oz.
Free potassium cyanide	1.0 oz.	0.8-1.2 oz.
Potassium hydroxide	4.0 oz.	2.0-6.0 oz.

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4. SOLUTION OPERATION & CONTROL (Cont.)
a. Limits: (Cont.)

Temperature: 63° - 68°C. (145°-155°F.)
 Cathode current density: 20-35 amp./sq. ft.
 D-C tank potential: 3-12 volts.
 Time: 30-60 sec.
 Anodes: 50% copper, 50% case-hardened steel.

- (1) Sampling: Submit a 100-200 cc. sample of solution each week to C & P Laboratory, making sure that solution is well agitated and up to operating temperature before taking the sample. See S.N. 34-36-1 for standard sampling procedure.

b. Purification:	<u>Contaminant</u>	<u>Purification Method</u>
	Insoluble matter	Filtration
	Carbonates	Precipitation with barium hydroxide
	Heavy metals	Dummy plating
	Organic matter	Activated carbon

Refer to S.N. 34-36-1A for carbonate precipitation procedure.

c. Notes:

- (1) The plating solution should be balanced as follows:

<u>Defect</u>	<u>Remedy</u>
Low copper	Add plating salts
Low cyanide	Add potassium cyanide
Low hydroxide	Add potassium hydroxide
High cyanide	Add copper cyanide
High cyanide & low copper	Add copper cyanide
High copper	Replace some of the copper anodes with insoluble anodes

- (2) Important - Parts shall be placed in plating solution immediately after strike and shall not be allowed to dry.
- (3) The solution should not be air agitated.
- (4) The minimum spacing between work and anode should be 4 inches. The solution should never be operated with less than a 2 to 1 anode to cathode ratio.
- (5) The anodes and cathodes (parts) must be completely immersed in the solution at all times.
- (6) Extreme care must be exercised to prevent the introduction of dirt or lint in the solution which may catch on the parts. The anodes should extend from one extremity of the jig to the other and should be as deep as the parts in the solution. Make cathode contact before lowering part into solution.
- (7) All electrical contact areas should be kept clean.

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5-4911-15-60 GSB, JHZ, HAK-121/bw



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5. DISPOSAL OF SOLUTIONS

- a. Determine the amount of cyanide present.
- b. Dilute with water.
- c. For every pound of cyanide add 0.72 lb. of sulfur and 0.26 lb. of unslacked lime to the solution.
- d. Heat to 90°C. for 2 hours stirring constantly during heating.
- e. Allow to stand overnight.
- f. Check for completion of reaction by inserting a bright copper wire. Destruction of cyanide is evidenced by wire turning dark.
- g. For disposal of the residue from the sulfur and lime treatment contact Buildings & Grounds Section.

6. SAFETY PRECAUTIONS

This strike solution is a CYANIDE solution and should be handled with extreme care - see S.N. 33-2-13A.

Under no circumstances should acid be introduced into the solution - cyanides in contact with acids develop deadly hydrocyanic acid gas which is colorless and nearly odorless (burnt-almond smell can be detected by some persons).

ENGINEERING SECTION
STANDARDIZING