Product Bulletin

Product Name: Electroless Copper 8100 A&B
Product Code: 2707004 & 2707005
Revision Date: January 9, 2024

Electroless Copper 8100

Electroless Copper 8100 is a two component, room temperature electroless copper system designed for the flash plating of printed circuit boards. The bath deposits a bright, ductile, fine grained copper flash which guarantees void-free coverage of thru holes and provides a conductive surface for subsequent electroplating.

Electroless Copper 8100 is a moderate speed bath which exhibits long solution life and excellent stability. The bath functions over a broad operating range and will consistently deposit thicknesses of 10 to 40 millionths of an inch depending upon immersion time and temperature. (a deposit thickness of 20 to 25 millionths will be obtained with a 15-minute immersion and a bath temperature of 70°F to 75°F).

Features & Benefits

Bright, ductile, grain free deposit	Void free, less rejects potential; Higher productivity
Moderate speed	More forgiving, more consistent deposit, less rejects; Higher productivity, lower cost of use

Operating Conditions

Temperature	70°F – 85°F (75°F optimum)
Time	10 min – 30 min
Workload	0.5 – 3.0 ft^2/Gal (1.0 – 1.5 ft^2/Gal optimum)
Agitation	Work rod
Filtration	Continuous through a 10-micron filter or daily batch filtration.
Aeration	Continuous low-pressure aeration is required for maximum stability

Chemical analysis capability is strongly recommended!

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Bath make-up

Di Water	84% by volume
8100A:	8% by volume
8100B:	8% by volume

1. Clean and thoroughly rinse the plating tank before making up the 8100-operating solution.
2. Add the required amount of di water to the tank.
3. Add 8% by volume of Electroless Copper 8100a concentrate.
4. Add 8% by volume of Electroless Copper 8100b concentrate and again mix thoroughly to obtain a uniform solution.
5. Check the temperature of the bath and adjust, if necessary, to 70°F to 75°F.

The bath is now ready to use.

Operation

Properly cleaned and activated PC boards are immersed in the Electroless Copper 8100 operating solution for the required time to achieve the desired thickness. For flash plating requirements, a 10-15-minute immersion time should be enough. The circuit boards should be mechanically agitated to ensure adequate solution transfer through the holes.

Replenishment

Replenishment of the operating solution is made with the Electroless Copper 8100a and Electroless Copper 8100b concentrates. The amount replenished can be approximated by the number of square feet processed or controlled by a simple titration procedure for copper. Replenishment amounts can be calculated by referring to the attached replenishment schedule.

Note: Each Monday and Thursday morning add 12 mL of electroless grade formaldehyde per gallon of Electroless Copper 8100 operating solution. Example: 50-Gal operating solution would require 600 mL of formaldehyde on Monday and Thursday.

This addition replaces the formaldehyde consumed during bath downtime and is in addition to normal replenishment of Electroless Copper 8100a and Electroless Copper 8100b.

Normal bath operation is accomplished by replenishing after a 10% to 15% drop in concentration. That is, replenishment occurs after 10% of the active chemistry is depleted.

Equipment

Tanks	Rigid PVC, Polypropylene, glass, CPVC, Polyethylene, or white Koroseal lined
Filtration	Use of 10-micron

	Polypropylene bag is recommended

Titration Method

Determination of copper sulfate concentration:

1. Titration method
   a. Pipette a 20 mL sample into a 250 mL Erlenmeyer flask.
   b. Add 10 mL of Glacial Acetic acid.
   c. Add 2 to 4g of Potassium Iodide crystals and mix until dissolved.
   d. Titrate with 0.1 N Sodium Thiosulfate until the solution goes from brown to yellow. Add 5 to 10 drops of starch indicator which will turn the solution blue. Continue titration until the blue color disappears.
   e. Record the number of mL of Sodium Thiosulfate used.

Calculation

(# mL thiosulfate) (normality of thiosulfate) (139) = % copper sulfate

2. By workload processed

Copper consumption

(As a function of load factor and time)

Ft^2/Gal	10 min @ 75°F	15 min @ 75°F	20 min @ 75°F	30 min @ 75°F
0.5	99%	98%	97%	95%
1.0	98%	97%	96%	94%
2.0	96%	94%	92%	88%
3.0	94%	91%	88%	82%
4.0 *	92%	88%	85%	76%
5.0 *	90%	85%	80%	70%
10.0 *	80%	70%	60%	40%

* Note: Load factor should not exceed 3 ft^2/Gal. These figures are added for theoretical replenishment data.

The copper sulfate concentration of a bath at full strength is 100%.

Determine the concentration of copper sulfate by either method. For every 10% low in copper sulfate, add 30 mL of Electroless Copper 8100a per gallon of operating solution. Also add an equal amount of Electroless Copper 8100b.

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Sample calculation

Copper analysis gives a 70% concentration level for a 100-gallon tank.

(100%-70%) (0.1) (100 Gal) (30 mL/Gal) = 9000 mL

To bring the bath to full strength, 9 liters of Electroless Copper 8100a should be added to the 100-gallon tank along with 9 liters of Electroless Copper 8100b. It will be necessary to remove an equivalent amount of solution from the operating solution before making these additions

Overnight stabilization

For extended periods of down time (i.e. overnight and weekends) do the following, turn the air up as high as possible. Add a 10% to 20% shot of 8100b. If the solution is warm, ice may be added to cool.

Waste Disposal

Operating solutions of Electroless Copper 8100 contain copper metal and are alkaline. Before disposing of the spent solution, the copper metal should be removed, and the pH adjusted to the regulated limits. Be sure to consult local agencies about regulations concerning pH limits and copper metal disposal.

Caution

Electroless Copper 8100a contains formaldehyde, a strong reducing agent, and *must not* be mixed with oxidizing agents. Use with adequate ventilation. Electroless Copper 8100b is highly alkaline and may cause severe burns or irritation. Avoid skin, eye and oral contact. When handling either solution wear protective clothing, gloves and goggles. Flush exposed areas immediately with clean, cold water. Contact a doctor immediately in case of injury.

Electroless Copper 8100 operating solution and Electroless Copper 8100b concentrate contain cyanide. Contact of these materials with acid materials may form a poisonous gas. Use only as directed. *Do not* take internally. Ventilation of the operating solution is required.

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