AUROLECTROLESS™ SMT 520 Immersion Gold

For PWB Metallization Applications

Regional Product Availability

- North America
- Asia
- Europe

Description

AUROLECTROLESS™ SMT 520 Immersion Gold bath produces uniform fine-grained deposits of pure gold on metallic substrates including electroless nickel and electroless palladium. The AUROLECTROLESS™ SMT 520 Immersion Gold bath is easy to control and has high tolerance to contaminants. Applied as part of ENIG or ENEPIG processes, the deposits are suitable for a wide variety of soldering and wire bonding applications.

Advantages

- Lower gold content substantially reduces operating costs
- Flexible and easy gold thickness control
- Excellent solderability

Bath Make-up for 1 Litre Bath

CAUTION! Hazardous cyanide-containing chemical

Component	Metric
Deionized Water	300 ml
AUROLECTROLESS™ SMT 520 Make-up Solution	450 ml
Potassium Gold Cyanide	1g
Deionized Water	To final operating volume

Make-up Procedure

CAUTION! Hazardous cyanide–containing chemical

1) Add 300 ml/l deionized water to a clean tank.
2) Slowly add AUROLECTROLESS™ SMT 520 Make-up Solution with continuous stirring.
3) Dissolve gold salts in a small volume of warm deionized water and add to the tank.
4) Adjust to final volume with deionized water.
5) Mix thoroughly.
6) Check pH and specific gravity and adjust as necessary.

Operation Parameters

CAUTION! Hazardous cyanide–containing chemical

Parameter	Range	Recommended
Gold Concentration	0.5–0.9 g/l	0.7 g/l
pH	5.8–6.2	6.0
Specific Gravity	1.11–1.15	1.13
Temperature	80–88˚C	83˚C
Agitation	Vigorous solution and/or mechanical	
Deposition Thickness	0.05–0.12 microns (2.0–4.8 microinches) in 9–15 minutes (electroless nickel substrate)	

Bath Maintenance

CAUTION! Hazardous cyanide–containing chemical

Gold Salt

Gold metal content should be measured daily and replenished with additions of gold salts. Replenishment is based on the results from the AAS analysis described below.

AUROLECTROLESS™ SMT 520 Replenisher

AUROLECTROLESS™ SMT 520 Replenisher is required to maintain the basic constituents of the electrolyte. Add 100 ml AUROLECTROLESS™ SMT 520 Replenisher for every 10g gold metal deposited.

Specific Gravity

Specific gravity should be measured daily and maintained in the recommended range by additions of AUROLECTROLESS™ SMT 520 Make-up Solution. Add 65 ml/l AUROLECTROLESS™ SMT 520 Make-up Solution to raise the specific gravity by 0.01 units.

pH

pH should be measured daily (on a sample cooled to room temperature) and maintained in the recommended range by additions of AUROLECTROLESS™ SMT 500 Acid Solution or potassium hydroxide. Add 10 ml/l (1% v/v) AUROLECTROLESS™ SMT 500 Acid Solution to lower the pH by 0.1 unit. Add 0.75 –1.0 g/l potassium hydroxide to raise the pH by 0.1 units. Dissolve the potassium hydroxide in water before making an addition.

Bath Analysis

Gold Content–by Atomic Absorption Spectroscopy

I. Equipment

a) 1 ml pipette
b) 200 ml volumetric flask

II. Reagents

Gold standard solutions (6 ppm and 12 ppm)

III. Procedures

a) Pipette 1 ml of sample solution into a 100 ml volumetric flask.
b) Dilute to the mark with deionized water.
c) Calibrate AAS with 6 ppm and 12 ppm Gold standards.
d) Measure gold content of the diluted sample solution for gold metal.
e) Record AAS reading.

IV. Calculation

Gold concentration (g/L) = AAS x 0.1

V. Replenishment

Required addition of gold salt (g) =
[(0.7 – measured gold concentration (g)) x tank volume (liters)] / 0.683

Equipment

Tanks:	Suitable heat resistant, stress-relieved natural polypropylene
Heaters:	Immersion heaters (glass, porcelain or PTFE)
Filtration:	Continuous solution filtration using 5 micron woven polypropylene cartridges

Operation Notes

1) The AUROLECTROLESS™ SMT 520 Immersion Gold bath should be replaced after approximately 14 metal turnovers, when the nickel in the bath reaches 900 ppm, or when the copper reaches 10 ppm (whichever comes first).

2) If necessary, the deposition rate can be increased by one or more additions of AUROLECTROLESS™ SMT 500 Additive. Individual adds of 2 ml/l of AUROLECTROLESS™ SMT 500 Additive should be made. Do not add more than a total of 6 ml/l of AUROLECTROLESS™ SMT 500 Additive during each bath adjustment.

Product Data

AUROLECTROLESS™ SMT 520 Make-up Solution

Appearance:	Colorless to very pale yellow solution
pH:	6.0–6.4
Specific Gravity:	1.25–1.29

AUROLECTROLESS™ SMT 520 Replenisher

Appearance:	Clear, colorless to very pale yellow solution
pH:	5.8–6.2
Specific Gravity:	1.105–1.145

AUROLECTROLESS™ SMT 500 Acid Solution

Appearance:	Clear, colorless solution
Total Acidity:	2.8–3.3 mol/L
Specific Gravity:	1.062–1.098

AUROLECTROLESS™ SMT 500 Additive

Appearance:	Colorless solution
Specific Gravity:	1.006–1.038

Handling Precautions

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

WARNING: DO NOT ACIDIFY this product, or working bath containing this product, below the specified operating range, or below pH 7 if no range is specified. Acidification may release highly toxic cyanide gas, which can be fatal if swallowed, inhaled or adsorbed through the skin.

CAUTION! Keep combustible and/or flammable products and their vapors away from heat, sparks, flames and other sources of ignition including static discharge. Processing or operating at temperatures near or above product flashpoint may pose a fire hazard. Use appropriate grounding and bonding techniques to manage static discharge hazards.

CAUTION! Failure to maintain proper volume level when using immersion heaters can expose tank and solution to excessive heat resulting in a possible combustion hazard, particularly when plastic tanks are used.

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Electronic Materials Technical Representative for more information.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products–from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

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Contact:
North America: 1-800-832-6200
Japan: (+81) 3-5213-2910
Asia: (+852) 2680-6888
Europe: (+41) 41-259-44-44
http://www.dow.com

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