ELECTRONIC MATERIALS
CIRCUIT BOARD TECHNOLOGIES

DURAPOSIT™ SMT 88

For PWB Metallization Applications

DESCRIPTION

Duraposit SMT 88 is an electroless nickel system specifically formulated for use in combination with Rohm and Haas Electronic Materials Aurolectroless immersion gold baths. Duraposit SMT 88 produces a bright uniform ENIG deposit on properly prepared PWB substrates.

The bath is designed to produce a deposit with a phosphorus content approximately 8.5–9.5 (measured by ICP-AA).

Plating performance is maintained at both high and low bath loading and the concentrated replenishment components minimize bath volume growth during usage.

The self-adjusting pH feature simplifies bath operation and makes the process ideal for use with Rohm and Haas Electronic Materials automatic bath control systems.

BATH CONCENTRATES

Duraposit SMT 88 is a three-component system. Two concentrates are used to make up the bath (Duraposit SMT 88 M and Duraposit R), while Duraposit R and Duraposit SMT 88 S are used for replenishment.

PLATING TANK PREPARATION

Prior to make-up of a Duraposit SMT 88 Electroless Nickel bath, the plating tank, pumps, pump lines and heaters should be cleaned, neutralized and rinsed with deionized (DI) water. The tank, pumps and heaters should be stripped with 30–50% nitric acid, rinsed thoroughly, neutralized with a 1% solution of ammonium hydroxide or potassium carbonate, drained, and rinsed with DI water. Filter bags or cartridges should be leached and rinsed in hot DI water before use.

BATH MAKE-UP (100 GALLONS)

Deionized Water	85 gallons
Duraposit SMT 88 M Electroless Nickel	10 gallons
Duraposit R Electroless Nickel	5 gallons

The deionized water should be added to the tank first, followed by Duraposit SMT 88 M Electroless Nickel. After these solutions are thoroughly mixed, Duraposit R Electroless Nickel should be added. Following complete mixing, the solution may be analyzed and any necessary adjustments made.

PLATING RATE

The plating rate of a freshly made-up bath, at 190°F (88°C), is approximately 0.6 mil/hour. At a rate of 0.6 mil/hour and a bath loading of 1.0 ft^2/gallon (2.45 dm^2/liter), the bath nickel concentration will deplete approximately 45% per hour.

BATH OPERATION

Temperature:	Duraposit SMT 88 Electroless Nickel baths may be operated between 180–195°F (82–91°C). Optimum temperature is 188°F (87°C).
Agitation:	Solution recirculation agitation is recommended. Side to side movement of the plating rack, together with bump agitation is preferred.
Filtration:	Continuous filtration through 5–10 micron filter bags or cartridges is recommended. Whenever the bath is transferred from one tank to another, batch filtration through a 3 or 5 micron filter bag is recommended.
pH:	Duraposit SMT 88 Electroless Nickel will make up at a pH of 4.8. During operation, the pH should be maintained between 4.6 and 5.0. If necessary, the pH may be adjusted upwards with either dilute aqueous ammonia or filtered liquid potassium carbonate, or downwards with dilute sulfuric acid.

CB04N063, Rev. 0
March 2004

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Loading: Maintain a minimum work load of 0.1 ft^2/gal. (0.24 dm^2/l). With manual replenishment, a maximum of 1.0 ft^2/gal. (2.45 dm^2/l) should be used. Use of an automatic controller will allow the use of higher loadings. Bath loading should be calculated based on total exposed copper surface of the PWBs to be processed, including both surface pads and through-holes.

Incoming Work: In order to ensure optimum process performance, it is important to ensure that PWBs entering the ENIG process have been properly prepared. All residues of metal resist (tin or tin-lead) must be completely removed, compatibility of the solder mask confirmed and proper cure and registration of solder mask ensured.

BATH CONTROL AND REPLENISHMENT

Nickel Analysis Procedure

I. Principle

Duraposit SMT 88 Electroless Nickel baths are maintained by additions based on regular analysis of nickel metal concentration.

II. Reagents

a) Ethylenediaminetetraacetic acid(EDTA), 0.05M

b) Concentrated ammonium hydroxide

c) Murexide indicator (0.2g murexide ground with 100g sodium chloride)

III. Procedure

a) Pipette a 5 ml sample of Duraposit SMT 88 Electroless Nickel bath [cooled to 100°F (38°C) or lower] into a 250 ml Erlenmeyer flask. The bath must be at working volume when the sample is taken.

b) Add 50 ml of distilled water.

c) Add 5 ml of ammonium hydroxide.

d) Add 0.2g murexide indicator.

e) Titrate with 0.05M EDTA from a pale-yellow to a purple end point.

f) Record the number of ml of EDTA titrated.

IV. Calculation

ml 0.05 EDTA* x 9.62 = % Nickel Concentration

*For other EDTA concentrations use:

ml of EDTA x M of EDTA x 192 = % Nickel Concentration

Replenishment Schedule for 100 Gallon Bath with Duraposit R and Duraposit SMT 88 S Electroless Nickels

% Nickel Conc.	g/l (as metal)	ml 0.05M EDTA	Duraposit R (ml)	SMT 88 S (ml)
105	6.4	10.9	None	None
100	6.1	10.4	None	None
95	5.8	9.8	950	1,900
90	5.5	9.4	1,900	3,800
80**	4.9	8.3	3,800	7,600
70	4.3	7.3	5,700	11,400
60	3.7	6.3	7,600	15,200

**If % nickel concentration falls below 85%, make the required additions in two portions, separated by at least 5 minutes. Make additions slowly and away from plating parts.

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HANDLING PRECAUTIONS

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

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

STORAGE

Store in accordance with the finished product container label.

WASTE TREATMENT

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

Due to the nature of Duraposit SMT 88 M and S, disposal of them, or residues therefrom, should be made in compliance with federal, state and local environmental regulations.

ELECTRONIC MATERIALS

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For locations and information please visit; **http://electronicmaterials.rohmhaas.com**

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