ROHM AND HAAS ELECTRONIC MATERIALS

TINPOSIT™ LF IMMERSION TIN

For PWB Metallization Applications

Regional Product Availability			
N. America	Japan/Korea	Asia	Europe
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DESCRIPTION

Tinposit LF Immersion Tin is an immersion tin formulation producing uniform and solderable tin deposits on properly prepared PWB substrates. Tinposit LF Immersion Tin is specifically formulated to be used in lead-free assembly processes. The deposits can maintain good solderability after multiple reflow processes. The Tinposit LF Immersion Tin bath is easy to control and has a high tolerance for contaminants.

PROCESS RECOMMENDATIONS

Copper parts must be free of oils, grease and other organic soil. The following is the recommended process flows:

1. Clean
2. Rinse
3. Microetch (sodium persulfate)
4. Rinse
5. Tinposit LF Immersion Tin Pre-dip
6. Tinposit LF Immersion Tin Bath
7. Rinse
8. Hot Water Rinse
9. Hot Water Rinse
10. Rinse
11. Dry

Important: Do not precede or follow Tinposit LF Immersion Tin with an alkaline treatment without an intervening acid treatment.

SOLUTION MAKE-UP FOR ONE LITER (Tinposit LF Immersion Tin Predip and Tinposit LF Immersion Tin Bath)

Chemicals Required	Volume
Tinposit LF Immersion Tin MU	992.0 ml
Tinposit LF Immersion Tin A	8.0 ml

MAKE-UP PROCEDURE

1. Add Tinposit LF Immersion Tin MU to a clean tank.
2. Slowly add Tinposit LF Immersion Tin A with continuous stirring.
3. Circulate the solution and heat to operating temperature.

Note: Tinposit LF Immersion Tin concentrates and bath are corrosive and caution should be exercised when handling both the concentrate and the prepared solution.

OPERATIONAL DATA

Parameter	Range	Optimum
Tin Metal	47–53 g/l	50 g/l
C component	180–220 g/l	205 g/l
A component	50–60 ppm	55 ppm
Copper	<16 g/l	
Temperature:		
Tinposit LF Immersion Tin Pre-dip	20–27°C	25°C
Tinposit LF Immersion Tin Bath	65–72°C	68°C
Time:		
Tinposit LF Immersion Tin Pre-dip	50–70 seconds	60 seconds
Tinposit LF Immersion Tin Bath	10–15 min	13 min
Agitation	Mild solution agitation and work agitation for temperature uniformity – do not use air	

BATH MAINTENANCE

Tinposit LF Immersion Tin Predip

Maintain the bath volume with Tinposit LF R concentrate.

For every 0.5 m^2 laminate area (1.0 m^2 panel surface area) processed, add 8.0 ml of Tinposit LF Tin Concentrate, 8.0 g of Tinposit LF C component and 0.45 ml of Tinposit LF A component. Control the concentration of Tinposit LF ImmersionTin Pre-dip in the desired range using the analysis procedure provided below, and adjusting with Tinposit LF A component, Tinposit LF Tin Concentrate and Tinposit LF C component as required.

TINPOSIT LF IMMERSION TIN

Tinposit LF Immersion Tin

Maintain the bath volume with D.I. water. For every 0.5 m^2 laminate area (1.0 m^2 panel surface area) processed, add 7.0 ml of Tinposit LF Tin Concentrate, 8.0 g of Tinposit LF C component, 0.95 ml of Tinposit LF A component and 10 ml of Tinposit LF R component.

Control the concentration of Tinposit LF Immersion Tin within the desired range using the analysis procedure provided below, and adjusting with Tinposit LF A component, Tinposit LF Tin Concentrate and Tinposit LF C component as required.

BATH ANALYSIS

COMPLEXER CONTENT

I. Equipment

a) 2 ml pipette
b) 20 ml pipette
c) 250 ml conical flask
d) 50 ml volumetric flask
e) 10 ml measuring cylinder
f) 50 ml measuring cylinder
g) 100 ml beaker
h) Filter paper (pore size 5–10 µm)

II. Reagents

a) Sodium hydroxide (5% v/v)
b) Phosphoric acid (1 M)
c) Potassium iodate (1/60 M)

III. Procedure

1. Pipette 2 ml of sample solution into a 100 ml beaker.
2. Add 20 ml of 5% sodium hydroxide solution into the above solution and wait for 3 minute for the precipitate to form.
3. Add 1M phosphoric acid solution into the above solution until the pH of the solution reaches about 2.7–2.8 and then wait 5 minutes for the precipitate to form.
4. Transfer the solution into a 50 ml volumetric flask and dilute to the mark with D.I. water.
5. Filter the solution by using the filter paper into a Clean and Dry beaker.
6. Pipette 10 ml into a conical flask.
7. Add 5 ml of 1M phosphoric acid a solution into the above solution.
8. Titrate the solution with 1/60M potassium iodate until the solution changes to yellow.

IV. Calculation

Complexer concentration (g/l) =
vol. of titrant (ml) × 25 × 76.12 × 0.96/100

V. Replenishment

Tinposit LF Immersion Tin C addition (g) =
(205 – Measured complexer concentration) ×
Volume of tank (liters)

TIN CONTENT

I. Equipment

a) 3 ml pipette
b) 250 ml conical flask
c) 25 ml measuring cylinder
d) 50 ml measuring cylinder

II. Reagents

a) EDTA (0.1M)
b) Xylenol orange (XO) indicator
c) Buffer solution: Dissolve 270g of sodium acetate trihydrate (or 163g sodium acetate anhydrous) in 500 ml of D.I. water, then add 60 ml of acetic acid and bring volume to 1L with D.I. water

III. Procedure

1. Pipette 3 ml of sample solution into a 250 ml conical flask.
2. Add 50 ml of D.I. water.
3. Using a measuring cylinder, add 15 ml of buffer solution and mix well.
4. Add 3 drops of XO indicator and titrate with 0.1M EDTA
5. When the colour of the solution changes from red to orange, add 3 more drops of XO indicator.
6. Continue to titrate with EDTA until the solution changes to yellow (end-point).

IV. Calculation

Tin concentration (g/l) =
Vol. of titrant (ml) × 118.7/30

V. Replenishment

Volume of Tinposit LF Tin Concentrate addition (ml) =

(50 – Measured tin concentration) × 1000/300 × Volume of tank (liters)

ADDITIVE CONTENT

I. Equipment

a) 3 ml pipette
b) 50 ml volumetric flask
c) 10 ml measuring cylinder

II. Reagents

a) Nitric acid
b) Silver Standards : 2 ppm and 6 ppm

III. Procedure

1. Pipette 3 ml of sample solution into 50 ml volumetric flask.
2. Add 4 ml of nitric acid solution.
3. Dilute to the mark with D.I. water and mix.
4. Calibrate AAS with the 2 ppm and 6 ppm Silver Standards
5. Measure the silver concentration in the sample solution.

TINPOSIT LF IMMERSION TIN

IV. Calculation

Additive content (mg/l) =
(Reading from AAS) × 50/3

V. Replenishment

Volume of Tinposit LF Immersion Tin A addition (ml) = [(55 – Measured additive content)/ 6.91] × Volume of tank (liters)

COPPER CONTENT

I. Equipment

a) 1 ml pipette
b) 1L volumetric flask
c) 50 ml measuring cylinder

II. Reagents

a) Nitric acid
b) Copper Standards: 2 ppm and 4 ppm

III. Procedure

1. Pipette 1 ml of sample solution into 1L volumetric flask.
2. Add 50 ml of nitric acid solution.
3. Dilute to the mark with D.I. water
4. Calibrate AAS with the 2 ppm and 4 ppm Copper Standards.
5. Measure the copper concentration in the sample solution.

IV. Calculation

Copper concentration (g/l) = Reading from AAS

EQUIPMENT

Tanks:	Polypropylene or CPVC Do not use stainless steel or titanium
Heaters:	Quartz or PTFE
Filtration:	Continuous solution filtration is recommended, using filters constructed of PVC or polypropylene. 5 micron filter cartridges are recommended.

PRODUCT DATA

Tinposit LF Immersion Tin MU

Appearance:	Clear, yellow solution
pH:	<1
Specific gravity at 20°C:	1.310–1.376

Tinposit LF Immersion Tin R

Appearance:	Clear, very pale yellow solution
pH:	<1
Specific gravity at 20°C:	1.227–1.287

Tinposit LF Immersion Tin A

Appearance:	Pale yellow to orange solution
pH:	<1
Specific gravity at 20°C:	1.032–1.058

Tinposit LF Tin Concentrate

Appearance:	Clear, very pale yellow solution
pH:	<1
Specific gravity at 20°C:	1.495–1.529

Tinposit LF Immersion Tin C

Appearance:	White crystalline solid

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.

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 Rohm and Haas Electronic Materials Technical Representative for more information.

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