

PROCIRC 9834TL

TIN/LEAD PLATING PROCESS

INTRODUCTION

Procirc 9834TL is a fluoborate based tin/lead plating process formulated to produce a 63/37 alloy deposit. It is primarily intended for use as an etch resist in printed circuit board manufacture, but it can also be used for barrel or rack plating.

BENEFITS

- Easy to maintain.
- Excellent throwing power down holes.
- Excellent solderability.
- Low tendency to Sn^{4+} formation.

SOLUTION MAKE -UP

Fluoroboric acid(50%)	76ml/L
Boric acid	25g/L
Tin fluoroborate	83ml/L
Lead fluoroborate	21ml/L
Procirc 9834 Additive	40ml/L

OPERATING DATA

	Range
Tin (g/L)	22 – 30
Lead (g/L)	9 – 12g/L
Fluoroboric acid	80 – 100g/L
Cathode cd (A/dm^2)	1 – 4
Anode cd (A/dm^2)	<2.5
Temperature ($^{\circ}\text{C}$)	20 – 25
Deposition rate	1 $\mu\text{m/min}$ at 1.5A/ dm^2

EQUIPMENT

Tanks	Steel or GRP lined with PVC, polypropylene or hard rubber.
Heaters	PTFE immersion with thermostatic control
Cooling	PTFE coils (if necessary).
Filtration	Continuous recommended, all plastic construction pump, 1/3 activated carbon.
Agitation	Work movement (not air agitation).
Anodes	60/40 tin/lead



INSTALLATION

1. Clean the process tank with water and leach overnight with warm fluoroboric acid (2-3% v/v).
2. 1/2 fill the tank with deionised water.
3. Add carefully with stirring the required volume of fluoroboric acid.
4. Add the required weight of boric acid. Stir until fully dissolved.
5. Add the tin and lead fluoroborates and mix.
6. Add the Procirc 9834 Additive and stir.
7. Top up with deionised water to volume then stir thoroughly.

MAINTENANCE AND CONTROL

The stannous tin, lead and fluoroboric acid concentrations should be analysed regularly using the methods detailed in this Data Sheet.

The Procirc 9834 Additive is maintained at an addition rate of 400ml/1000 Ahr.

ANALYSIS METHODS

1. Stannous tin

Reagent

Concentrated hydrochloric acid.
Iodine indicator.
0.1N iodine.

Method

1. Pipette 5ml of the plating solution into a 500ml conical flask.
2. Add approximately 100ml deionised water.
3. Add 5ml concentrated hydrochloric acid.
4. Add a few drops iodine indicator.
5. Titrate with 0.1N iodine to a permanent blue end point.
6. Record $t = t$ mls.

Calculation

$$t \times 1.187 = \text{g/L tin}$$

Replenishment

For every 1g/L tin required, add 3.3ml/L Tin fluoroborate solution



2. Lead

Reagents

Hydrogen peroxide
0.1M EDTA
0.1M Zinc sulphate
20%v/v triethanolamine
Ammonia/ammoniumchloride buffer (54g/L ammonium chloride, 350ml/L ammonia solution).
Erichrome Black T indicator

Method

1. Pipette 5ml of the plating solution into a 250ml conical flask.
2. Add approximately 100ml deionised water.
3. Add 1ml hydrogen peroxide and mix.
4. Pipette 10ml 0.1M EDTA in to the flask.
5. Add 5ml 20% triethanolamine and 20ml buffer solution.
6. Add a pinch of erichrome Black T indicator.
7. Titrate with 0.1M zinc sulphate solution to a purple end point.
8. Record titre = A ml.
9. In a separate flask pipette 10ml 0.1M EDTA.
10. Add 100ml deionised water.
11. Add 20ml buffer and a pinch of Erichrome Black T indicator.
12. Titrate with 0.1M zinc sulphate to a purple end point.
13. Record titre = B ml.

Calculation

$$[1 - (A/B)] \times 41.44 = \text{g/L lead.}$$

Replenishment

For every 1g/L lead required , add 2 ml/L lead fluoroborate.

3. Free acid

Reagents

1.0N sodium hydroxide.

Method

1. Pipette 5ml of the plating solution into a 250ml conical flask.
2. Add approximately 50ml deionised water.
3. Titrate with 1.0N sodium hydroxide mixing thoroughly during additions to the first turbidity.
4. Record titre = t ml.



Calculation

$(t \times 8.8) - (1.1 \times \text{g/L tin}) = \text{g/L free fluoroboric acid.}$

Replenishment

For every 1g/L fluoroboric acid required, add 1.4 ml/L fluoroboric acid.

DISPOSAL

Dispose of in accordance with local authority requirements.

PRODUCT FAMILIES

The following products are referred to in this data sheet.

PRODUCT NAME	PRODUCT NUMBER
Procirc 9834	984007
Tin fluoroborate	577005
Lead fluoroborate	MC241
Fluoroboric acid	577007

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