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PROCIRC 983

TIN PLATING PROCESS

INTRODUCTION

Procirc 983 is a sulphate based tin plating process formulated to produce fine grained pure tin deposits over a wide range of current densities. 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

Wide current density range 5 to 50A/ft² depending on metal concentration.

Easy to maintain.

Excellent throwing power down holes.

Excellent solderability.

Low tendency to Sn^{4+} formation.

SOLUTION MAKE-UP

Sulphuric acid, chem. pure, SG 1.84	105ml/L
Procirc 9830 Tin Salt	30g/L
Procirc 9831 Grain Refiner	10ml/L
Procirc 9832 Carrier	20ml/L

PREPARATION (for 100 litres)

1. Clean the process tank with water and leach overnight with warm sulphuric acid (5% v/v).
2. Add 70 litres cold deionised water to the tank.
3. Add carefully with slow stirring, 10.5 litres sulphuric acid.
4. Add 3kg Procirc 9830 Tin Salt to the warm solution and stir to dissolve.
5. Allow the solution to cool to room temperature then add the Procirc 9832 Carrier and stir. Add the Procirc 9831 Grain Refiner and stir.
6. Top up with deionised water to 100 litres then stir thoroughly.

EQUIPMENT

Tank	Steel or GRP lined with PVC, polypropylene or hard rubber.
Heating	PTFE immersion with thermostatic control.
Cooling	PTFE coils (if necessary).
Filtration	Continuous recommended, all plastic construction pump.
Agitation	Work movement (not air agitation).
Anodes	Pure tin to BS 1468.

OPERATING DATA

	Range	Optimum
Stannous tin	8 - 22g/L	15g/L
Sulphuric acid	160 - 220g/L	185g/L
Cathode current density	1-2A/dm²	1.5A/dm²
Anode current density	2A/dm²	
Temperature	13 - 29°C	20 - 21°C
Deposition rate	1µm/minute at 2A/dm²	

MAINTENANCE AND CONTROL

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

The organic additives are consumed mainly through drag-out and as a guide can be added on the following ampere hour basis:-

Procirc 9831 Grain Refiner	100ml/1000 amp. hours
Procirc 9832 Carrier	120ml/1000 amp. hours

ANALYSIS METHODS

Stannous tin

Reagent

Concentrated hydrochloric acid.
Starch indicator.
0.1N iodine.

Procedure

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

Calculation

t x 1.187 = g/litre tin

Replenishment

For every 1g/L tin low, add 1.8g/L Procirc 9830 Tin Salt.

Sulphuric acid

Reagents

1.0N sodium hydroxide.

Procedure

1. Pipette 10ml of the plating solution into a 500ml conical beaker.
2. Add approximately 150ml deionised water.
3. Titrate with 1.0N sodium hydroxide mixing thoroughly during additions to a turbid end point.
4. Record titre = t ml.

Calculation

t x 4.9 = g/litre sulphuric acid.

Replenishment

For every 1g/L sulphuric acid low, add 0.5 ml/L sulphuric acid.

DISPOSAL

Dispose of in accordance with local authority requirements.

PRODUCT FAMILIES

The following products or product families are referred to in this data sheet:-

Product Name	Product Number
Procirc 9830 Tin Salt	983001
Procirc 9831 Grain Refiner	984001
Procirc 9832 Carrier	984002