



STANNOTEK

Bright Acid Tin

INTRODUCTION

Stannotek is a sulphuric acid based bright tin plating process, suitable for technical and decorative applications. Stannotek can be used for rack and barrel plating.

BENEFITS

- Fully bright, levelled deposits.
- Excellent solderability.
- High ductility.
- Wide current density range - excellent bright throwing power.
- Low tendency to Sn^{4+} formation.

SOLUTION MAKE -UP

Stannous Sulphate	30g/L
Sulphuric acid, SG 1.84	100ml/L
Stannotek Carrier	20ml/L
Stannotek Brightener	2ml/L
Stannotek Additive	20ml/L

1. Clean the process tank with water and leach the tank with warm sulphuric acid (5%) overnight pumping through all filters, pumps and pipework. Pump out acid and rinse thoroughly with water.
2. $\frac{3}{4}$ fill the tank with cold deionised water.
3. Add carefully, with slow stirring, sulphuric acid.
4. Add Stannous Sulphate to the warm solution and stir to dissolve.
5. Allow the solution to cool to room temperature, then add Stannotek Carrier, Brightener and Additive.
6. Top up with deionised water and stir thoroughly.



OPERATING DATA

	Range	Optimum
Stannous tin	8 – 22g/L	15g/L
Sulphuric acid	140 – 210g/L	176g/L
Temperature	13 – 35°C	20 - 25°C
Cathode current density Rack	1 – 2asd	1.5asd
Barrel	0.5 – 1.5asd	1.0asd
Anode current density	2asd	
Deposition rate	1µm/min at 2 asd	

EQUIPMENT

Tanks	Steel or GRP lined with PVC, polypropylene or hard rubber.
Heaters	PTFE immersion with thermostatic control.
Cooling	PTFE coils.
Filtration	Continuous recommended, all plastic construction pump.
Agitation	Work movement (<u>not</u> air agitation).
Anodes	Pure tin to BS 1468.

MAINTENANCE AND CONTROL

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

Stannotek Carrier, should be added at a rate of 300 to 500 ml/1000 amp hours.
Stannotek Additive should be added at a rate of 200 to 400 ml/1000 amp hours.
Stannotek Brightener should be added at a rate of 50 to 150 ml/1000 amp hours.

Drag in of chloride should be avoided.

Post Treatment - after rinsing a dip in 1 - 5% w/w sodium hydroxide is recommended before final rinsing and drying.

ANALYSIS METHODS



1. Stannous tin

Reagents

Concentrated hydrochloric acid.
Iodine indicator.
0.1N iodine.

Method

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 titre = t mls.

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

Replenishment

For every 1g/L tin low, add 1.8g/L Stannous Sulphate

2. Sulphuric acid

Reagents

1.0N sodium hydroxide.

Method

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 mls.

Calculation - $t \times 4.9 = \text{g/L sulphuric acid.}$

Replenishment

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

DISPOSAL

Dispose of through an approved specialist contractor.



TROUBLE SHOOTING GUIDE

PROBLEM	REASON	REMEDY
Burnt deposits at high CD	1. Cathode CD too high 2. Low metal content 3. Poor agitation	1. Reduce CD 2. Increase tin content 3. Improve agitation
Brittle Deposit	1. Cathode CD too high	1. Reduce CD
Rough or grainy deposit	1. Suspended particles in bath 2. Additives out of balance	1. Check anode bags: filter solution 2. Add additives in increments
Treeing	Lack of Carrier	Add Carrier in 1ml/L increments
LCD Dullness	Lack of Brightener	Add Brightener in 0.25ml/L increments
Dull deposits on corners (areas of high agitation)	Excess of carrier	Add additive in 0.5ml/l increments or Brightener in 0.25ml/l increments
Low CD dullness	High temperature	Cool solution
Poor throwing power	1. Metal too high 2. Acid too low 3. Carrier and additive too low	1. Allow metal to fall by reducing anode area 2. Adjust acid content 3. Add Carrier in 1.0ml/L increments and additive 0.5ml/l increments (AVOID OVERDOSE)
Brown hazy deposit at medium CD	Excess Additive	Add 0.25-0.5ml/L Brightener
Peeling of bright deposits	Excess Brightener	1. Add carrier 1 in 1ml/L increments 2. Reduce Brightener additions 3. Plate out
Patchy deposits	Low Brightener	Add 0.5ml/L Brightener
Low bath efficiency / slow plating	Low tin metal Low bath temperature	Keep the tin metal between 8 -22g/l, Optimum 15g/l.

PRODUCT FAMILIES

The following products are referred to in this data sheet.

PRODUCT NAME	PRODUCT NUMBER
Stannotek Carrier	574024
Stannotek Brightener	574025
Stannotek Additive	574026

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