Uberkote™ Sn SO4

Bright Acid Tin Process

Uberkote™ Sn SO4 is a two component system for bright acid Stannous Sulphate plating process for rack and barrel operations. Highly stable bath during idle periods, produces bright deposit over a wide range of metal concentrations.

Features/Benefits

- Economic: Low Brightener consumption
- Temperature Stable Solution: Produces bright deposits up to 38°C/100°F
- Good quality technical grade Sulphuric Acid can be used: C.P. Grade is not required.
- Excellent throwing power: Does not burn at extreme current densities.
- Operates over a wide range of metal concentration

Operating Conditions

Tin Metal	7.5 - 22.5 g/L
Sulphuric Acid	8 - 10 % b.v.
Uberkote™ Sn Carrier	5% b.v.
Uberkote™ Sn Brightener	1% b.v.
Temperature	16 - 38°C (60 - 100°F)
Current Density	5 - 30 ASF
Optimal Barrel Tin	10.5 - 12.75 g/L
Optimal Rack Tin	12 - 16.5 g/L

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Uberkote™ Sn Rinse: is a post-plate rinse to eliminate staining, and improve solderability especially beneficial when parts need to be heat treated. Promotes adhesion of labels and surface printing. Uberkote™ Sn plated parts should be rinsed immediately after the plating cycle. Dip racks, or basket loads in 30 - 45 g/L Uberkote™ Sn Rinse for 2 - 10 seconds at 70 - 80°C (160 - 180°F). Follow by a cold rinse and hot rinse, then drying. If parts are barrel plated, they should be transferred to a stainless steel basket.

Uberkote™ Sn Regenerator: precipitates stannic tin that builds up in tin plating. As the Stannic concentration grows it can lead to an increase of additive consumption in sulphate tin plating due to the organic absorbing surfaces of the colloidal solids. In rack plating excessive stannic may cause roughness. If the stannic content climbs abnormally fast it could be a result of aggressive agitation or another introduction of air into the bath. Also, ensure that the anode current density is under 15 amps/sq/ft. Follow this QR code to learn more and watch a precipitation video:

Filtration: Periodic or continuous filtration with a 5 - 15 micron polypropylene or Dynel. Carbon treatment can be performed if the solution is contaminated with organics. Dummy plating will remove metallic contaminants.

Tanks: Polypropylene or rubber-lined steel; leach with 5% Sulphuric Acid for 8 - 10 hours prior to use.

Heaters: Porcelain or quartz with polypropylene guard or PTFE. Steel Pipes coated with a suitable plactic can also be used.

Anodes: Pure Tin anodes with 1:1 Anode to Cathode ratio.

Agitation: is essential to ensure even deposition and to allow maximum operating current densities. Mechanical agitation is recommended. Air agitation should not be used as it will cause excessive foaming and stannic formation. Slow Mechanical, Rod Movement and Ciculating Pump can be used for this purpose.

Solution Control

The solution must be kept chemically balanced to provide desired maximum performance. Analysis of tin metal and sulfuric acid are performed at least once a week or if plating issues arise. Uberkote™ Sn Carrier is added in ratio to to sulphuric acid; add 0.5L Uberkote™ Sn Carrier for every 1L of Sulphuric Acid. Uberkote™ Sn Brightener is consumed at a rate of 1 - 2 L per 1000-ampere hours. Optimum consumption rates are achieved at a temperature of 24 - 29°C.

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Hull Cell: test is a performance test that should be performed daily. It should be performed with "as is" solution, using reciprocal rod movement or magnetic stirrer and the following parameters:

Rack and Barrel	1 amp	3 min
Reel to Reel, High Speed Plating	5 amp	2 min

If the panel shows signs of chemical imbalanced displayed as burning, roughness, poor coverage or non-uniformity perform a solution analysis. Determine appropriate additions of base chemical and/or Uberkote™ Sn additives. In each application the Uberkote™ Sn additives are depleted by drag out. Addition should be made in small increments based on Hull Cell testing.

Tin Analysis

1. Pipette a 5 ml sample of plating solution into a 250 mL Erlenmeyer flask.
2. Add 100 mL distilled or DI water
3. Add 50 mL concentrated Hydrochloric Acid
4. Slowly add 0.5g Sodium Bicarbonate to dispel air
5. Add 1 mL 1% Start Indicator Solution
6. Titrate with 0.1N Potassium Iodate to a blue end point that persists for 30 seconds.

Calculation: ml of 0.1N Potassium Iodate x 1.185 = g/L Tin
ml of 0.1N Potassium Iodate x 0.158 = oz/gal Tin

Sulphuric Analysis

1. Pipette a 5 mL sample of plating solution into a 250 mL Erlenmeyer flask.
2. Add 50 mL 4% Ammonium Oxalate solution.
3. 5 ml Methyl Red indicator solution.
4. Titrate with 1N Sodium Hydroxide from red to a yellow end point.

Calculation: ml of 1N Sodium Hydroxide x .53 = % b.v. Sulphuric Acid

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Troubleshooting Guide

Overall Dullness	Low Brightener	Add .1 - .75% Brightener
	High Bath Temperature (>38°C)	Maintain bath at 18 - 29°C
	Chloride contamination >100ppm	Cut bath to lower chloride
LCD Dullness	High Tin metal	Keep tin metal at 10.5-12.75g/L for Barrel, and 12-16.5 g/L for Rack
	High Bath Temperature (>32°C)	Maintain bath at 18 - 29°C
	Metallic contamination (> 10ppm Cu, Pb or Cd)	Dummy plate or treat bath with 10g of tin dust per 100L of solution
	Low Carrier	Add 0.5 - 2% Carrier
	Low Sulphuric Acid	Add Sulphuric to 10 -11%
Blistering	Metallic contamination (>10ppm Cu)	Dummy plate or treat bath with 10g of tin dust per 100L of solution
	Low Bath Temperature (<15.5°C)	Maintain bath at 18 - 29°C
	Poor Cleaning	Charge or change cleaners
	Low Tin Metal	Keep tin metal at 10.5-12.75g/L for Barrel, and 12-16.5 g/L for Rack
Pitting	High Brightener	Add 0.5 - 2% Carrier. Allow Brightener to deplete or carbon treat with 10-20g Carbon per 100L of Solution
	Excessive Current Density	Lower Current

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Pitting (continued)	Poor Bath Agitation	Increase agitation
Rough/Grainy Deposit	Poor Filtration	Use 1 - 5 micron filter
HCD Burning	Low Sulphuric Acid	Add Sulphuric Acid to 10 -11%
	Low Tin Metal	Keep tin metal at 10.5-12.75g/L for Barrel, and 12-16.5 g/L for Rack
	Low Bath Temperature (<15.5°C)	Maintain bath at 18 - 29°C
	Current density too high	Maintain current density between 5 - 30 ASF
Staining	Poor Rinsing	Increase rinse flow rate or add Uberkote™ Sn Rinse
	Low Brightener	Add 0.1 - 0.2% Brightener
	Low Carrier	Add 0.75 - 1% Carrier
Low Efficiency/Slow Plating	Low Tin Metal	Keep tin metal in optimal range for rack or barrel
	Low Bath Temperature	Maintain bath at 18 - 29°C
	Low Sulphuric Acid	Add Sulphuric Acid to 10 - 11%
Little/NO LCD Coverage	High Tin Metal	Keep tin metal at 10.5-12.75g/L for Barrel, and 12-16.5 g/L for Rack
Tin Metal Increases	Too Much Anode Area	Reduce tin area by 10 -40%
	High Cathode Current Density	Reduce Current
	Excess Sulphuric Acid	Maintain at low end of range

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Brittle Deposit	High Brightener	Add 0.5 - 2% Carrier. Allow Brightener to deplete or carbon treat with 10-20g Carbon per 100L of Solution
Polarized Anodes	Anode current density too high	Add anodes or lower current density
Poor Solderability	Poor Rinsing	Increase rinse flow rate or add Uberkote™ Sn Rinse
	High Brightener	Add 0.5 - 2% Carrier. Allow Brightener to deplete or carbon treat with 10-20g Carbon per 100L of Solution
	Substrate migration through tin deposit (eg zinc from zincate on aluminum)	Nickel (copper) strike parts before tin plating, or increase thickness of tin deposit
	Improper solder temperature	Adjust solder temperature to optimum
	High Nickel Contamination	Dummy plate, or cut bath
	Chloride contamination above 100 ppm	Cut bath to lower chloride

The data and statements contained in this bulletin are based on testing information and are believed to be accurate and reliable. This bulletin is not a Guarantee or Warranty, express or implied regarding the products use. The product is sold on the condition that the purchaser will do their own tests to determine the suitability of the product in a particular application.

READ THE MSDS BEFORE USING THIS PRODUCT

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