

# ACCU-LABS INC.

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**A2LA Accredited ISO/IEC 17025:2005 Certificate # 2558.01**

## **TINSTAR 801 ACID TIN SULFATE**

### **General Description:**

Accu-Labs TinStar 801 acid tin process produces uniform tin deposits over a wide current density range, at extremely flexible operating parameters. The process offers high conductivity with excellent plate distribution; and performs equally as well in barrel and rack applications. When the bath is properly maintained and parts are processed with the appropriate post plating treatment, whisker formation and tin pests are greatly minimized.

### **Advantages:**

- Easy to Use –Single component system for matte deposits or Dual component system for bright deposits. Less inventory of chemistry required.
- Versatile – May be operated within a wide range of concentrations and current densities.
- Stable – No extra addition required after extended shutdown.
- Minimal to moderate foaming depending on application.

### **Chemicals required:**

Stannous Sulfate (Tin 54.6%)

Reagent or Technical Grade Sulfuric Acid (S.G. 1.84)

**TinStar 801 Starter-A for Matte Process**

**TinStar 801 Starter-A and 801 Brightener-B for Bright Process**

Makeup for one liter for **801 Matte Process:**

Stannous Sulfate	21 g/l
Sulfuric Acid	100 ml/l
801 Starter-A	20-40 ml/l
DI Water	Balance to 1 liter

Makeup for one liter for **801 Bright Process:**

Stannous Sulfate	21 g/l
Sulfuric Acid	100 ml/l
801 Starter-A	20-40 ml/l
801 Brightener-B	10-30 ml/l
DI Water	Balance to 1 liter

**GUIDELINES**

Tin Metal	11.0 g/l (6.0-20.0)
Sulfuric Acid	184 g/l (147-220)
Temperature	60-90°F
Cathode Current Density	1-30 ASF (Barrel) 2-60 ASF (Rack)
Anode to Cathode Ratio	1:1 Pure Tin
Agitation	Mild mechanical, filtration pump
Filtration	Periodic or Continuous 5-10 microns

**Equipment**

Tank: Solutions should be contained in PVC, polypropylene, Hastaloy C or Monel tanks. Acid resistant fiberglass tanks are not suitable because of possibility of grain refiners dissolving tank resins.

Anodes: Anodes should be 99.99% pure tin. Extruded rather than cast anodes are preferred. Anode baskets and hooks should be fabricated from zirconium. Monel or titanium hooks, if used, should be coated with plastisol or equivalent. Inert anodes can also be used utilizing liquid addition agents of metal components. During down time anodes should be removed from process tank. [Anode Bags]: Anode bags are not generally required except in instances of extreme roughness. When used, leach bags of polypropylene in a 5-10% v/v solution of sulfuric acid for at least twenty-four hours.

Temperature: Maintaining the temperature of the solution within the recommended operating range of 60-90° F is recommended for optimum performance. Coils, plates, or a heat exchanger that are fabricated from Teflon® or Karbate® are compatible. Cooling is the main requirement; but in some instances, a heating provision may also be required. A bypass in the cooling system or coils to permit steam entry is an effective method of providing heat.

**Filtration:** To avoid roughness and for purification procedures, if required, a filter is recommended. Continuous filtration through a 10-micron filter is recommended for routine operation for batch purification, a 5 or 10-micron filter may be required. The filter should be capable of 2-3 turnovers per hour. Filter cartridges should be made of polypropylene or Dynel.

**Agitation:**

Mechanical agitation is not necessary to obtain a uniform deposit, however a moderate amount of agitation will improve the throwing abilities of the bath and allow higher current densities for a given solution composition. Cathode rod agitation for rack applications should be at least 5-25 ft/min.

**New Solution Makeup:**

1. Fill tank ½ full with room temperature DI water.
2. Add the required amount of sulfuric acid, slowly stirring to avoid localized heat eruptions.
3. Add the required amount of stannous sulfate.
4. Let solution cool to room temperature.
5. Add the required amount of TinStar 801 addition agent(s).
6. Bring the bath volume up to desired operating level with cold DI water.

**Solution Control:** Regular concentration checks by titration are the best way to maintain effectiveness and economy. A titration procedure is available upon request.

TinStar 801 components are best controlled by use of a conventional plating test, such as the Hull Cell. The Hull Cell will determine the amount of the additive needed to bring the bath to optimum operating level, provided that all other constituents are within proper chemical composition range. The process panels will monitor the production work and keep it cosmetically acceptable. TinStar 801 components are the only maintenance additives usually required to keep the electrolyte functioning properly. The additives should be replenished at a rate of 250-500 mls for every 1000 ampere-hours until process optimization occurs; your ACCU-LABS Technical Service Representative will assist in making this determination. **NOTE:** This replenishment recommendation is a guideline only; certain applications may require more or less depending on the condition of equipment i.e. loss due to drag-out etc. A sample should be sent to ACCU-LABS periodically to serve as a check against one's own analysis.

**Handling Considerations:** Always wear eye protection and personal protective gear when handling or working with this material; read MSDS prior to use.

**Disclaimer:** *The aforementioned recommendations are true and accurate to the best of our knowledge. However, since conditions and use are beyond our control no guarantee is expressed or implied. Accu-Labs, Inc. will not incur any liability in connection with the use of the aforementioned suggestions or technical data.*