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A2LA Accredited ISO/IEC 17025:2005 Certificate # 2558.01

TinStar 220 MSA Matte Tin and Tin/Lead Process

General Description:

Accu-Labs TinStar 220 matte MSA acid tin and tin/lead process produces uniform matte tin or tin/lead 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, rack, and high speed applications. This process surpasses all military specifications for salt spray and solderability.

Advantages:

- Easy to Use – Single component system. Less inventory of chemistry required.
- Versatile – May be operated within a wider range of concentrations, current densities, and temperatures than conventional tin or tin/lead baths.
- Stable – No extra addition required after extended shutdown.
- Minimal to moderate foaming depending on application.
- Fine grained deposits, excellent solderability, easily reflowed.

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 or exact alloy. 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. 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 MSA for at least twenty-four hours.

Chemicals used:

TinStar MSA Tin Concentrate, 300 g/l SG 1.57

TinStar MSA Acid, MSA 70% (945 g/l) SG 1.35

TinStar MSA Lead Concentrate 500 g/l SG 1.66

TinStar Accu-Labs 220 Carrier

Solution Makeup	Rack / Barrel	Reel to Reel	High Speed
MSA Tin Concentrate (ml/l)	37	150	253
MSA Acid (ml/l)	180	106	180
MSA Lead Concentrate for 90/10 alloy (ml/l)	1.4	6	10
MSA Lead Concentrate for 60/40 alloy (ml/l)	6	23	38
Accu-Labs 220 Carrier (ml/l)	40	40	40
DI Water	Balance	Balance	Balance

OPERATING GUIDELINES	Rack & Barrel	Reel to Reel	High Speed
TIN METAL g/l	11 (6-30)	45 (30-60)	76 (60-90)
MSA (Acid) g/l	170 (140-220)	100 (80-200)	170 (120-220)
LEAD METAL g/l for 90/10	0.7 (0.5-1.4)	2.8 (1.9-3.8)	4.8 (3.8-5.5)
LEAD METAL g/l for 60/40	2.8 (2.0-3.5)	11.2 (9.5-13.0)	19.0 (17.0-21.0)
220 CARRIER	4% & per Hull Cell	4% & per Hull Cell	4% & per Hull Cell
TEMPERATURE	60-120°F	60-120°F	60-120°F
CURRENT DENSITY	1-30 ASF	10-300 ASF	30-500 ASF
ANODE RATIO	1:1	1:1	1:1
AGITATION	Cathode Rod; Filter Pump; Barrel Rotation	Filter Pump; Strip Movement; Moderate Mechanical	Filter Pump; Strip Movement; Vigorous Mechanical
FILTRATION	Periodic or continuous 1-10 micron	Periodic or continuous 1-10 micron	Periodic or continuous 1-10 micron

New Solution Makeup:

1. Fill tank ½ full with room temperature DI water.
2. Add the required amount of MSA, slowly stirring to avoid localized heat eruptions.
3. Add the required amount of Tin and Lead MSA Concentrates.
4. Let cool to room temperature.
5. Add the required amount of TinStar 220 Carrier.
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 220 Carrier is best controlled by use of a conventional plating test, such as the Hull Cell. The Hull Cell will determine the amount of carrier 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 220 Carrier is the only maintenance additive usually required to keep the electrolyte functioning properly. The additive should be replenished at a rate of 250 mls for every 1000 ampere-hours. **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.

A sample should be sent to ACCU-LABS periodically to serve as a check against one's own analysis.

Handling Considerations:

Proper precautions when handling should be observed. Do not take internally. When handling this product, avoid contact to skin and eyes. Wear clean chemical resistant clothes, chemical goggles, rubber gloves, apron, boots, gauntlets, and full-face shield when handling.

First Aid: If skin comes in contact with chemical, immediately flush affected area with clean cold water for a minimum of 15 minutes. For eyes, obtain medical attention immediately

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