

TS-14 Immersion Tin Pre Dip Solution

GENERAL DESCRIPTION

The TS Immersion Tin process is a lead-free replacement for the hot air leveling process. It covers the copper surface with a specialized-engineered immersion white tin metal that retains solderability through multiple assembly cycles.

TS14 is an important part of the TS immersion coating process. It is designed to be used as a pre-dip to the TS28 Immersion Tin solution. It protects the tin solution from contamination and normality imbalance. TS14 contains a special blend of acidic and organic compounds that control the coating's porosity. It conditions the copper, allowing for a complete coverage in the TS28 bath.

CONTROL PROCEDURES

Replenishments can be made to TS14. The solution activity is maintained with additions of fresh TS14 solution. The pH of the solution is maintained below 1.0 with additions of TS14. The solution should be discarded when the copper concentration exceeds 2,000 ppm.

MAINTENANCE

<u>Specific Gravity</u>	<u>Activity</u>	<u>TS14 addition</u>
1.040	100%	None
1.032	80%	56 mls per liter
1.024	60%	112 mls per liter
1.016	40%	168 mls per liter

Failure to maintain the activity above 40% will cause an imbalance of activity and possible activation problems for the copper. The solution should be replaced when the activity drops below 40%.

Iron contamination can cause a dark tin deposit and possibly solderability issues, when drug from the TS14 pre-dip into the immersion tin baths. It is very important that metal parts do not come into contact with the TS14 bath. All metal parts used

Operating Parameters

PARAMETERS	VALUES
Make-Up	25% TS14 by volume in DI water
Temperature	60 to 90°F (16 to 33°C)
Immersion Time	1 to 2 minutes
Process	Batch Tank
Agitation	Mechanical work bar, do not use air
Ventilation	Advised
Tanks	Polypropylene, Polyethylene. Do not use PVC
Racks and Baskets	Plastic-coated stainless steel; use polypro or Halar (black or green). Do not use PVC
Heaters	Quartz, Enamel, Teflon, PTFE with power < 2W per sq. cm

Physical Properties

PROPERTIES	
Specific Gravity	1.13- 1.17
Appearance	Clear liquid
Odor	Acidic



must be coated in an appropriate type of plastic. See “Operating Parameters”.

ANALYSIS PROCEDURES

Acid Normality

Reagents and Equipment

0.1 N Sodium Hydroxide

Cresol Red indicator solution (0.1g in 100 ml 20% Alcohol)

250 ml Erlenmeyer flask

5 ml pipette

50 ml burette

Procedure:

1. Pipette 5 ml of TS14 working solution into the 250 ml Erlenmeyer flask.
2. Add 75 ml of deionized water and 4 to 5 drops of Cresol Red indicator solution.
3. While swirling the solution, titrate with 0.1 N sodium hydroxide to a purple endpoint.
4. Calculation:

$$\text{Normality} = (\text{mls of base}) \times (\text{Normality of base}) \times 0.2$$

An active TS14 solution should be maintained between a normality of 0.30 and 0.50. An addition of 10 ml per liter of TS14 will raise the Normality 0.1 units.

Copper Concentration

Discard when copper levels exceed 2,000 ppm. Copper concentration can be determined by Quant Strip or AAS.

SAFETY AND STORAGE

TS14 is an acidic blend of inorganic salts and acids. Avoid breathing vapors. Use in a well-ventilated area. When handling solution, wear protective clothing, gloves and chemical safety goggles. In case of skin contact, remove contaminated clothing and flush affected area with plenty of cold water. In case of eye contact, flush immediately with plenty of cold water and seek medical attention immediately.

Store all TS materials in their original container. Keep away from direct sunlight and temperature extremes. Store away from alkaline materials.

WASTE TREATMENT

TS14 contains salts, tin salts and acids. The working solution of TS14 is considered a corrosive acid solution. It will contain some copper. This copper may be removed from the solution by pH adjusting the solution to above 9 with dilute caustic soda. This will precipitate both the tin and copper. Allow the precipitate to settle. Filter the solution and then make a final pH adjustment of the solution to between 6 and 8 with dilute sulfuric acid before sending the spent solution to the sewer. Consult with local officials for further disposal regulations.



MISCELLANEOUS

- Packaging comes in 1 gallon, 5 gallon, and 55 gallon containers. Consult MSDS sheet for additional information.
- The information given in this technical data sheet is to the best of our knowledge accurate. It is intended to be helpful but no warranty is expressed or implied regarding the accuracy of such data. It is the users responsibility to determine the suitability of his own use of the product described herein; and since conditions of the use are beyond our control, we disclaim all liability with respect to the use of any material supplied by us. Nothing contained herein shall be construed as permission or as recommendations to practice any patented invention without a license from the patent owner nor as recommendation to use any product or to practice ant patented invention without a license from the patent owner nor as recommendation to use any product or to practice any process in violation of any law or any government regulations. Revised 6.04.02