



## Solderon™ BT-150

### **High-Speed, Low-Foaming Bright Tin Process**

Solderon BT-150 is a high speed, sulphonate-based tin process formulated for continuous electroplating of wire and connector strip in reel-to-reel machines and provides fully bright pure tin deposits over a wide range of current density and bath temperature.

The low-foaming Solderon BT-150 electrolyte is free of volatile aldehydes and may be operated at temperatures up to 45°C and tin concentrations up to at least 100 g/l without loss of deposit brightness.

Convenient methods of analysis are available for the proprietary components.

**OPERATIONAL DATA**

Parameter	Range	Optimum
Tin(II)	50 - 100 g/l	60 g/l
Solderon Acid HC	200 - 280 ml/l	210 ml/l
Solderon BT-150 Carrier	40 - 80 ml/l	60 ml/l
Solderon BT-150 Additive	15 - 50 ml/l	25 ml/l (tin metal = 50 - 70 g/l) 40 ml/l (tin metal = 70 - 100 g/l)
Solderon Part G	3 - 8 ml/l	4 ml/l
Solderon RD Concentrate	10 - 15 ml/l	12 ml/l
Temperature	20 - 45°C	30°C (See below*)
Anodes	Pure tin slabs or slugs in titanium baskets. Platinised titanium mesh.	
Cathode current density	5 - 50 A/dm <sup>2</sup>	25 A/dm <sup>2</sup>
Anode current density	0.1 - 5.0 amp/dm <sup>2</sup> (anode to cathode ratio is relatively unimportant)	
Agitation	Vigorous solution coupled with cathode movement	
Deposition Rate	10 microns/minute at 25 A/dm <sup>2</sup>	

\*Solderon BT-150 is designed to produce fully bright deposits over a wide temperature range and cooling of the solution is rarely necessary. High current/voltage per unit volume will cause the solution temperature to increase and, where appropriate, cooling coils should be used to maintain the temperature below 45°C.

**SOLUTION MAKE UP FOR ONE LITRE**

Chemicals Required	Quantity
Deionised water	500 ml
Solderon Tin Concentrate 300 g/l	200 ml
Solderon Acid HC	90 ml
Solderon BT-150 Carrier	40 ml
Solderon BT-150 Additive	40 ml
Solderon RD Concentrate	12 ml
Deionised water	To final volume

**Make up procedure**

1. Add deionised water to a clean tank.
2. Add Solderon Acid HC and Solderon Tin Concentrate slowly with continuous stirring.
3. Add Solderon BT-150 Carrier, Solderon BT-150 Additive and Solderon RD Concentrate with stirring.
4. Dilute to final volume with deionised water.

**EQUIPMENT**

Tanks:	Temperature-stabilised translucent white polypropylene
Heaters	PVDF-clad panel heaters or titanium with thermostatic control
Coolers:	PTFE or titanium coils
Filtration:	Preferably continuous using 5 micron woven polypropylene cartridges. Flow rate at least three times tank volume/hour
Electrical Supply:	Up to 12 volts stabilised DC supply with preference for stepless control and ampere-minute meter.
Extraction:	Recommended

**EQUIPMENT PREPARATION**

Prior to makeup, the process tank and ancillary equipment should be thoroughly cleaned and then leached with Solderon Acid solution. This procedure is particularly important for new equipment and that previously used with other processes, for example fluoboric acid systems.

**Cleaning solution**

Trisodium phosphate 15 g/l  
Sodium hydroxide 15 g/l

**Leaching solution**

Solderon Acid HC 35 ml/l

**Procedure**

1. Thoroughly wash down tank and ancillary equipment with clean water.
2. Flush the complete system with water.
3. Add the cleaning solution to the tank, heat to 55 - 60°C and circulate through the complete system.
4. Discard the cleaning solution.
5. Flush the complete system with water.
6. Add the leaching solution and circulate through the complete system.
7. Leave the leaching solution in the tank for a minimum of eight hours.
8. Circulate leaching solution through the complete system.
9. Discard the leaching solution.
10. Flush the complete system with water.

**SOLUTION MAINTENANCE**

- Replenishment:** For every 1000 Ah add 0.5 - 1.0 litre of Solderon BT-150 Additive. Solderon Part G additions are made based on analysis.
- Solderon Tin Concentrate:** To increase the tin concentration by 1 g/l, add 3.3 ml/l of Solderon Tin Concentrate 300 g/l. With the addition of 1 ml/l Solderon Tin Concentrate 300 g/l the Solderon Acid HC content will be increased by 0.6 ml/l.
- Solderon Acid HC:** Solderon Acid HC is used to maintain the acid level of the bath. 1 ml/l Solderon Acid HC increases Acid HC content by 1 ml/l.
- Solderon RD Concentrate:** Solderon RD Concentrate is designed to minimize the oxidation of tin in the electrolyte. Maintenance additions are made based on UV analysis for Solderon RD Concentrate.
- Solderon BT-150 Carrier:** Solderon BT-150 Carrier additions are made based on analysis.

**GENERAL NOTES**

1. For convenience, Solderon Acid HC is expressed as ml/l total acid. A more correct description of acid concentration is g/l free acid. This is calculated as follows:  
$$\text{g/l Free Acid} = (\text{ml/l Total Solderon Acid HC} - \text{g/l Sn(II)}) \times 1.713 \times 0.945$$
2. In the pretreatment, the parts should be processed in a solution of 20% Solderon Acid HC in water at 20°C. Nickel alloy or nickel plated substrates may need an activation stage in the pretreatment to avoid poor adhesion and to improve solderability (e.g. Ronasalt 369). Copper and copper alloy substrates require etching, e.g. Circuposit 3330 Etch, to remove any surface defects which may impair solderability.
3. To precipitate tin from waste water rinses the pH should be increased to within the range 8 - 9 using sodium hydroxide. The resulting precipitate must be allowed to settle before decanting the clear liquor.
4. During use Solderon solutions may slowly generate stannic tin resulting in a turbid electrolyte. The use of Clarostan SO is particularly effective in removing suspended stannic tin and a periodic treatment is recommended.

When ordering please use the following product descriptions:

### **LIST OF PRODUCTS**

<b>Product Name</b>
Solderon Tin Concentrate 300 g/l
Solderon Acid HC
Solderon BT-150 Additive
Solderon BT-150 Carrier
Solderon Part G
Solderon RD Concentrate

Electroplating chemicals and specialties can be corrosive, harmful and poisonous. Care should be taken with respect to appropriate storage, handling and utilisation. When disposing such chemicals, the regulations regarding the treatment of waste water are to be strictly observed.

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