



SOLDERON™ BLS

For Electronic Finishing Applications

DESCRIPTION

Solderon BLS is a low-speed tin-lead plating process designed to produce bright deposits from an organic sulfonate electrolyte. Fully-solderable deposits can be plated with alloy compositions ranging from 60% through 95% tin. The process offers enhanced throwing power and low current density brightness.

ADVANTAGES

- Non-fluoborate electrolyte
- Excellent brightness
- Fully-solderable deposits
- Excellent throwing power
- Stable alloy and thickness distribution over the working current density range

DEPOSIT PROPERTIES

Alloy Composition 60–95% Tin, 5–40% Lead

BATH MAKE-UP

Chemicals Required

Solderon Tin HS-400 Concentrate

Solderon Lead Concentrate

Solderon Acid HC

Solderon BLS Starter

Solderon RD Concentrate

Refer to specific alloy solution make-up procedures on the following pages for exact quantities required.

MAKE-UP PROCEDURE

1. Add deionized water to tank.
2. Slowly add Solderon Acid HC and mix thoroughly.
3. Add Solderon Tin HS-400 Concentrate and mix thoroughly.
4. Add Solderon Lead Concentrate and mix thoroughly.
5. Add Solderon BLS Starter and mix thoroughly.

6. Add Solderon RD Concentrate and mix thoroughly.
7. Dilute to final volume with deionized water and mix thoroughly.

Note: Solderon Tin and Lead Concentrates contribute to the total Solderon Acid HC content in the electroplating process.

Bath Operation—Metric

Parameter	Range	Recommended
Solderon BLS Starter	30–50 ml/l	40 ml/l
Temperature	16–23°C	19°C
Cathode Current Density	0.5–2.5 A/dm ²	Dependent upon equipment design and production requirements
Agitation	Mild, mechanical	
Deposition Rate	0.19 microns per minute at 0.5 A/dm ²	

Bath Operation—U.S.

Parameter	Range	Recommended
Solderon BLS Starter	3–5% v/v	4% v/v
Temperature	60–75°F	65°F
Cathode Current Density	5–25 A/ft ²	Dependent upon equipment design and production requirements
Agitation	Mild, mechanical	
Deposition Rate	7.5 microinches per minute at 5 A/ft ²	

PRETREATMENT PROCEDURES

A final activation step of 7–14% Solderon Acid HC is recommended prior to entering the electroplating cell.

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Bath Make-up, 90/10 Tin-Lead Alloy—Metric

Chemicals Required	Barrel	Rack
Deionized Water	400 ml/l	400 ml/l
Solderon Acid HC	230 ml/l	215 ml/l
Solderon HS-400 Concentrate	12.5 ml/l	25.5 ml/l
Solderon Lead Concentrate	1.8 ml/l	3.5 ml/l
Solderon BLS Starter	40 ml/l	40 ml/l
Solderon RD Concentrate	10 ml/l	10 ml/l

Dilute to final volume deionized water

Bath Make-up, 90/10 Tin-Lead Alloy—U.S.

Chemicals Required	Barrel	Rack
Deionized Water	40% v/v	40% v/v
Solderon Acid HC	23% v/v	21.5% v/v
Solderon HS-400 Concentrate	1.25% v/v	2.55% v/v
Solderon Lead Concentrate	0.18% v/v	0.35% v/v
Solderon BLS Starter	4% v/v	4% v/v
Solderon RD Concentrate	1% v/v	1% v/v

Dilute to final volume deionized water

Bath Operation, 90/10 Tin-Lead Alloy—Metric

Parameter	BARREL		RACK	
	Range	Recommended	Range	Recommended
Tin (II)	3–10 g/l	5 g/l	5–20 g/l	10 g/l
Lead	0.4–1.3 g/l	0.8 g/l	0.8–2.7 g/l	1.6 g/l
Solderon Acid HC	215.0–285.0 ml/l	250.0 ml/l	215.0–285.0 ml/l	250.0 ml/l

Bath Operation, 90/10 Tin-Lead Alloy—U.S.

Parameter	BARREL		RACK	
	Range	Recommended	Range	Recommended
Tin (II)	0.4–1.3 oz./gal.	0.67 oz./gal.	0.67–2.7 oz./gal.	1.3 oz./gal.
Lead	0.05–0.17 oz./gal.	0.1 oz./gal.	0.1–0.4 oz./gal.	0.2 oz./gal.
Solderon Acid HC	21.5–28.5% v/v	25% v/v	21.5–28.5% v/v	25% v/v

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Bath Make-up, 60/40 Tin-Lead Alloy—Metric

Chemicals Required	Barrel	Rack
Deionized Water	400 ml/l	400 ml/l
Solderon Acid HC	230 ml/l	215 ml/l
Solderon HS-400 Concentrate	12.5 ml/l	25.5 ml/l
Solderon Lead Concentrate	4.4 ml/l	9 ml/l
Solderon BLS Starter	40 ml/l	40 ml/l
Solderon RD Concentrate	10 ml/l	10 ml/l

Dilute to final volume deionized water

Bath Make-up, 60/40 Tin-Lead Alloy—U.S.

Chemicals Required	Barrel	Rack
Deionized Water	40% v/v	40% v/v
Solderon Acid HC	23% v/v	21.5% v/v
Solderon HS-400 Concentrate	1.25% v/v	2.55% v/v
Solderon Lead Concentrate	0.44% v/v	0.9% v/v
Solderon BLS Starter	4% v/v	4% v/v
Solderon RD Concentrate	1% v/v	1% v/v

Dilute to final volume deionized water

Bath Operation, 60/40 Tin-Lead Alloy—Metric

Parameter	BARREL		RACK	
	Range	Recommended	Range	Recommended
Tin (II)	3–10 g/l	5 g/l	6–20 g/l	10 g/l
Lead	1.25–3.0 g/l	2 g/l	2.5–8.0 g/l	4.0 g/l
Solderon Acid HC	215.0–285.0 ml/l	250.0 ml/l	215.0–285.0 ml/l	250.0 ml/l

Bath Operation, 60/40 Tin-Lead Alloy—U.S.

Parameter	BARREL		RACK	
	Range	Recommended	Range	Recommended
Tin (II)	0.4–1.3 oz./gal.	0.67 oz./gal.	0.8–2.7 oz./gal.	1.3 oz./gal.
Lead	0.17–0.4 oz./gal.	0.27 oz./gal.	0.33–1.1 oz./gal.	0.53 oz./gal.
Solderon Acid HC	21.5–28.5% v/v	25% v/v	21.5–28.5% v/v	25% v/v

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BATH MAINTENANCE

Solderon BLS Replenisher

Solderon BLS Replenisher contains the components required during operation of the bath to maintain uniform, bright deposits. Solderon BLS Replenisher is added at a rate of 1 liter per 1,000 ampere hours or as required based upon Hull cell analysis.

Solderon BLS Starter

Solderon BLS Starter contains all of the active components necessary upon make-up to produce bright deposits. Depending on individual drag out rates, additions of Solderon BLS Starter may be required during the operation of the bath based on Hull cell analysis.

Solderon Tin HS-400 Concentrate

Solderon Tin contains 400 g/l of tin (II). To raise tin concentration 1.0 g/l (0.13 oz./gal.), add 2.5 ml/l (0.25% v/v) Solderon Tin HS-400 Concentrate.

Solderon Lead Concentrate

Solderon Lead Concentrate contains 450 g/l of lead. To raise lead concentration 1.0 g/l (0.13 oz./gal.), add 2.2 ml/l (0.22% v/v) Solderon Lead Concentrate.

Solderon Acid HC

Solderon Acid HC is used to maintain the acid level of the bath. To raise acid concentration 1% by volume, add 10 ml/l Solderon Acid HC.

Solderon RD Concentrate

Solderon RD Concentrate is an antioxidant developed by Rohm and Haas Electronic Materials to minimize the formation of stannic tin. The concentration should be maintained at 5 to 15 ml/l (0.5–1.5%). Solderon RD Concentrate should be added at a rate of 40 ml per 1,000 ampere hours or as required based on quantitative UV/VIS analysis.

Clarostan S.O.

Clarostan S.O. is a flocculating agent that helps to clarify turbid Solderon plating solutions.

PRODUCT DATA

Solderon BLS Starter

Appearance: Clear, pale yellow to amber liquid

pH: <2.0

Specific Gravity: 1.025

Solderon BLS Replenisher

Appearance: Clear, colorless to pale amber liquid

pH: <2.0

Specific Gravity: 0.99

Solderon Tin HS-400 Concentrate

Appearance: Clear, colorless to slight yellow liquid

pH: <2.0

Specific Gravity: 1.695

Solderon Lead Concentrate

Appearance: Clear, colorless to pale yellow liquid

pH: <2.0

Specific Gravity: 1.60

Solderon Acid HC

Appearance: Clear, colorless to pale yellow liquid

pH: <1.0

Specific Gravity: 1.35

Clarostan S.O.

Solderon RD Concentrate

Appearance: Clear, colorless to pink/amber liquid

pH: <1.0

Specific Gravity: 1.043

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EQUIPMENT

Tanks:	Polypropylene, Polyethylene or PVDC
Anodes:	Soluble—Tin or Tin-Lead alloy balls or slugs in Type 316 stainless steel baskets; Tin or Tin-Lead alloy slabs with titanium hooks Note: Anode baskets must be kept full at all times. Insoluble—Iridium Oxide or Platinized Titanium Note: Insoluble anodes must be used for a portion of the total anode area to maintain the tin concentration of the bath within normal operating limits. Typical operations may require up to 50% of the anode area as insoluble anodes.
Filtration:	Continuous, 1 micron polypropylene filter cartridge
Solution Chilling:	Titanium, Polypropylene or Teflon heat exchangers; see operating parameters for temperature requirements

EQUIPMENT PREPARATION

Prior to make-up, the process tank and ancillary equipment should be thoroughly cleaned and then leached with a Solderon Acid solution.

This procedure is particularly important for new equipment or equipment previously used for other processes, for example, fluoboric acid-based systems.

I. Cleaning Solution

- Trisodium Phosphate: 15 g/l (2 oz./gal.)
- Sodium Hydroxide: 15 g/l (2 oz./gal.)

II. Leaching Solution

Solderon Acid HC: 70 ml/l (7% v/v)

III. Procedure

- Thoroughly wash down tank and ancillary equipment with clean water.
- Recirculate water through the complete system to remove water soluble materials.
- Discard water.
- Add cleaning solution to the tank, heat to 55–60°C (130–140°F) and recirculate through the complete system.
- Discard cleaning solution.
- Recirculate water through the complete system.
- Discard water.
- Add leaching solution and recirculate through the complete system.
- Leave leaching solution in tank for minimum of 8 hours.
- Recirculate leaching solution through the complete system.
- Discard leaching solution.
- Recirculate water through the complete system.
- Discard water.

HANDLING PRECAUTIONS

Before using this product, consult the Material Safety Data Sheet for details on product hazards, recommended handling precautions and product storage.

CAUTION! When using immersion heaters, failure to maintain proper volume level can expose tank and solution to excessive heat resulting in a possible combustion hazard, particularly when plastic tanks are used.

STORAGE

Store all Solderon BLS products in tightly closed containers at temperatures above 10–32°C (50–90°F). For specific and complete recommendations involving precautionary handling procedures of Solderon BLS materials, please refer to the appropriate Hazardous Material Labels and Material Safety Data Sheets supplied with these products.

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

WASTE TREATMENT

It is the user's responsibility to verify that treatment procedures comply with federal, state and local regulations. Contact your Rohm and Haas Electronic Materials Technical Representative for more information.

Due to the acidic nature of Solderon BLS solutions disposal of it, or residues therefrom, should be made in compliance with federal, state and local environmental laws.

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ELECTRONIC MATERIALS

Circuit Board Technologies

CMP Technologies

Microelectronic Technologies

Packaging and Finishing Technologies

For locations and information please visit; <http://electronicmaterials.rohmhaas.com>

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