

## PRODUCT DATA SHEET

# Indium5.8LS

## Pb-Free Solder Paste

### Introduction

**Indium5.8LS** is a halide-free, no-clean solder paste specifically formulated for low flux spatter. This material is designed to accommodate the higher processing temperatures required by the SnAgCu, SnAg, and other Pb-free alloy systems in an air or nitrogen reflow atmosphere. This product formulation offers consistent, repeatable printing performance combined with long stencil and tack times to handle the rigors of today's high speed as well as high mix surface mount lines.

### Features

- Ultra-low flux spattering (ideal for applications with Au finger connectors)
- Ultra-low solder beading
- Halogen-free
- Superior stencil life
- Outstanding print characteristics
- Extremely wide process window

### Alloys

Indium Corporation manufactures low-oxide spherical powder composed of a variety of Pb-free alloys that cover a broad range of melting temperatures. Types 3 and 4 powders are standard offerings with SAC305 and SAC387 alloys. The metal percent is the weight percent of the solder powder in the solder paste and is dependent upon the powder type and application. Standard product offerings are detailed in the table below.

### Standard Product Specifications

Alloy	Metal Load	
	Type 3	Type 4
96.5Sn/3.0Ag/0.5Cu (SAC305)	89.0%	88.5%

#### Industry Standard Test Results and Classification

Flux Classification	ROLO	Typical Solder Paste Viscosity SAC305 Indium5.8LS, T3, 89.0% SAC305 Indium5.8LS, T4, 88.5%	1,700 poise 1,600 poise
Based on the testing required by the current version of IPC J-STD-004		Conforms with all requirements from IPC J-STD-005	
Halogen-free and low halogen per J-STD-004, IEC, and JEDEC requirements	<<1,000ppm Cl <<1,000ppm Br		

*All information is for reference only.*

*Not to be used as incoming product specifications.*

### Packaging

Standard packaging for stencil printing applications includes 4oz jars and 6 or 12oz cartridges. Packaging for enclosed print head systems is also readily available. For dispensing applications, 10 and 30cc syringes are standard. Other packaging options may be available upon request.

### Storage and Handling Procedures

Refrigerated storage is recommended throughout the shelf life of solder paste. The shelf life of **Indium5.8LS** is 6 months when stored at <10°C. Store syringes and cartridges tip down.

Remove solder paste from refrigeration at least 2 hours before use to allow the solder paste to reach an ambient working temperature. As the time to reach thermal equilibrium will vary with container size, verify solder paste temperature prior to use. Label jars and cartridges with the date and time of opening.

### Compatible Products

- **Rework Flux:** TACFlux® 018
- **Cored Wire:** CW-807
- **Wave Flux:** WF-9945, WF-9958

### Technical Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Material Science as it applies to the electronics and semiconductor sectors, Technical Support Engineers provide expert advice in solder preforms, wire, ribbon, and paste. Indium Corporation's Technical Support Engineers provide rapid response to all technical inquiries.

### Safety Data Sheets

The SDS for this product can be found online at <http://www.indium.com/sds>

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## Printing

### Stencil Design:

Electroformed and laser cut/electropolished stencils produce the best printing characteristics among stencil types. Stencil aperture design is a crucial step in optimizing the print process. The following are a few general recommendations:

- Discrete components—A 10–20% reduction of stencil aperture has significantly reduced or eliminated the occurrence of mid-chip solder beads. The “home plate” design is a common method for achieving this reduction.
- Fine-pitch components—A surface area reduction is recommended for apertures of 20mil pitch and finer. This reduction will help minimize solder balling and bridging that can lead to electrical shorts. The amount of reduction necessary is process-dependent (5–15% is common).
- For adequate release of solder paste from stencil apertures, a minimum aspect ratio of 1:5 is required. The aspect ratio is defined as the width of the aperture divided by the thickness of the stencil.

## Printer Operation

Solder Paste Bead Size	~20–25mm in diameter
Print Speed	25–150mm/second
Squeegee Pressure	0.018–0.027kg/mm of blade length
Underside Stencil Wipe	Start at once per every 5 prints and decrease frequency until optimum value is reached
Squeegee Type/Angle	Metal with appropriate length/~60 degrees
Separation Speed	5–20mm/second or per equipment manufacturer's specifications
Solder Paste Stencil Life	>8 hours (at 30–60% RH and 22–28°C)

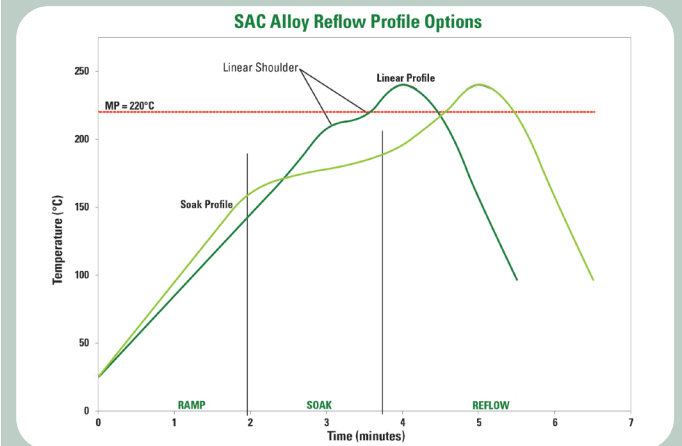
## Cleaning

Indium5.8LS is designed for no-clean applications; however, the flux can be removed, if necessary, by using a commercially available flux residue remover.

**Stencil Cleaning:** This is best performed using isopropyl alcohol (IPA) as a solvent. Most commercially available stencil cleaners work well.

## Reflow

### Recommended Profile:



The stated profile recommendations apply to most Pb-free alloys in the SnAgCu (SAC) alloy system, including SAC305 (96.5Sn/3.0Ag/0.5Cu). This can be used as a general guideline in establishing a reflow profile when using **Indium5.8LS Solder Paste**. Deviations from these recommendations are acceptable, and may be necessary, based on specific process requirements, including board size, thickness, and density. Start with the linear profile, then move to the optional soak profile, if needed. The flat soak portion of the linear profile (linear shoulder) may also be eliminated.

Reflow Profile Details	SAC305 Parameters		Comments
	Recommended	Acceptable	
Ramp Profile (Average Ambient to Peak)—Not the Same as Maximum Rising Slope	1.0–1.5°C/second	0.5–2.5°C/second	To minimize solder balling, beading, hot slump
Soak Zone Profile (optional)	20–60 seconds	30–120 seconds	May minimize BGA/CSP voiding Eliminating/reducing the soak zone <u>may</u> help to reduce HIP and graping
	140–160°C	140–170°C	
Time Above Liquidus (TAL)	45–60 seconds	30–100 seconds	Needed for good wetting/reliable solder joint As measured with thermocouple
Peak Temperature	230–260°C	230–262°C	
Cooling Ramp Rate	2–6°C/second	0.5–6°C/second	Rapid cooling promotes fine-grain structure
Reflow Atmosphere	Air or N <sub>2</sub>		N <sub>2</sub> preferred for small components

All parameters are for reference only.

Modifications may be required to fit process and design.

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All of Indium Corporation's solder paste and preform manufacturing facilities are IATF 16949:2016 certified. Indium Corporation is an ISO 9001:2015 registered company.

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