Indium5.8LS
Pb-Free Solder Paste

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

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 and SnAg 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.

Alloys
Indium Corporation manufactures low-oxide spherical powder composed of a variety of Pb-free alloys that cover a broad range of melting temperatures. Type 4 and Type 3 powder 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
96.5Sn/3.0Ag/0.5Cu (SAC305)	88.5% (Type 4)
96.5Sn/3.0Ag/0.5Cu (SAC305)	89.0% (Type 3)

Packaging
Standard packaging for stencil printing applications includes 4 oz. jars and 6 oz. or 12 oz. cartridges. Packaging for enclosed print head systems is also readily available. For dispensing applications, 10cc 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 two 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

Safety Data Sheets
The SDS for this product can be found online at http://www.indium.com/sds

Industry Standard Test Results and Classification			
Flux Classification	ROL0	Typical Solder Paste Viscosity for SAC305 T4 (Poise)	1650
Based on the testing required by the current revision of IPC J-standard-004.		for SAC305 T4 (Poise)	1750
Halogen-free and low-halogen per J-004, IEC, and JEDEC requirements	<<1000ppm Cl <<1000ppm Br	Conforms with all requirements from the current revision of IPC J-standard-005.	

All information is for reference only. Not to be used as incoming product specifications.

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Form No. 97801 (A4) R14

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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 20 mil 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)

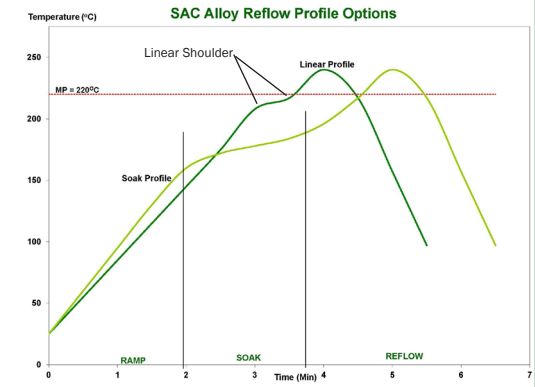
Cleaning

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.

Note: All parameters are for reference only. Modifications may be required to fit process and design.

Reflow Profile Details	SAC305 Parameters		Comments
	Recommended	Acceptable	
Ramp Profile (Average Ambient to Peak) - Not the Same as Maximum Rising Slope	0.5–1°C/Second	0.5–2.5°C/Second	To minimize solder balling, beading, hot slump
Soak Zone Profile (Optional)	30–90 Seconds	30–120 Seconds	May minimize BGA/CSP voiding Eliminating/reducing the soak zone may help to reduce HIP and graping
	160–180°C	150–200°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_2		N_2 preferred for small components

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