PRODUCT DATA SHEET

Indium8.9ES
Solder Paste

Introduction

Indium8.9ES is a no-clean solder paste for use in air or nitrogen reflow with tin-lead based solder alloys.

Indium8.9ES offers excellent print transfer efficiency to work in the broadest range of processes. In addition, the high oxidation resistance of **Indium8.9ES** virtually eliminates incomplete coalescence (graping) on small deposits.

Alloys

Indium Corporation manufactures low-oxide spherical powder in a wide variety of alloys. Type 3 and Type 4 powder are standard offerings with Sn62 and Sn63 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.

Product Specifications

Alloy	Powder Type	Metal Load
Sn63/Pb37	T4	90%

Compatible Products

- Rework Flux: TACFlux® 020B, TACFlux® 089HF
- Cored Wire: CW-807
- Wave Flux: WF-7742, WF-9942

Features

- Excellent printing performance
- Wide reflow window in both air and nitrogen and low peak reflow temperatures
- Strong wetting performance on a variety of surfaces
- Minimal voiding in QFN and BGA assemblies

Storage and Handling Procedures

Refrigerated storage will prolong the shelf life of solder paste. Solder paste packaged in cartridges should be stored tip down.

Storage Conditions (unopened containers)	Shelf Life
<10°C	6 months

Solder paste should be allowed to reach ambient working temperature prior to use. Generally, paste should be removed from refrigeration at least two hours before use. Actual time to reach thermal equilibrium will vary with container size. Paste temperature should be verified before use. Jars and cartridges should be labeled with date and time of opening.

Packaging

Indium8.9ES is currently available in 500g jars or 600g cartridges. Packaging for enclosed print head systems is also readily available. Alternate packaging options may be available upon request.

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BELLCORE AND J-STD TESTS & RESULTS

Test	Result
J-STD-004A (IPC-TM-650)	
• Flux Type (per J-STD-004A)	ROL1
• Flux Induced Corrosion (Copper Mirror)	Type L
• Presence of Halide Ion Chromatography	<0.5% Cl- eq.
• SIR	Pass

Test	Result
J-STD-005 (IPC-TM-650)	
• Typical Solder Paste Viscosity Malcom (10 rpm) Sn63 90.5% T4	1700 Poise
• Slump Test	Pass
• Solder Ball Test	Pass
• Typical Tackiness	40g
• Wetting Test	Pass
• Electromigration	Pass

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

Form No. 98974 R4

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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 optimum transfer efficiency and release of the solder paste from the stencil apertures, industry standard aperture and aspect ratios should be adhered to.

Printer Operation	
Solder Paste Bead Size	~20–25mm in diameter
Print Speed	25–125mm/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 / ~45 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)

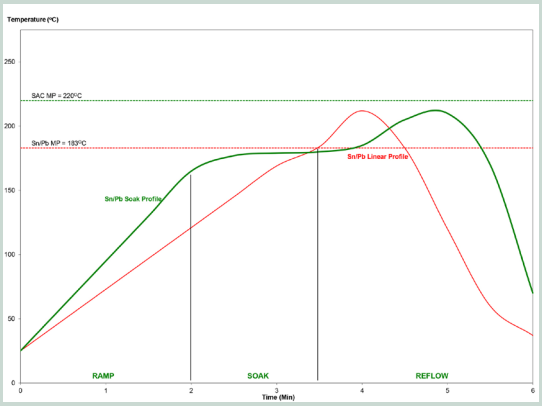
Cleaning

Indium8.9ES is designed for no-clean applications, however the flux can be removed if necessary by using a commercially available flux residue remover.

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

Reflow

Recommended Profile:



This profile is designed for use with Sn63/Pb37 and Sn62/Pb36/Ag2 and can serve as a general guideline in establishing a reflow profile for use with other alloys. Adjustments to this profile may be necessary based on specific process requirements. 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	SnPb 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
	140–150°C	130–170°C	
Time Above Liquidus (TAL)	45–60 Seconds	30–100 Seconds	Needed for good wetting/reliable solder joint As measured with thermocouple
Peak Temperature	198–213°C	195–233°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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