PRODUCT DATA SHEET

Indium9.0E
Pb-Free Solder Paste

Features
- Eliminates clogged apertures through advanced rheology
- High oxidation resistance
- Excellent wetting
- Eliminates hot and cold slump
- Halogen-free per EN14582 test method
- Excellent soldering performance under high temperature and long reflow processes

Introduction
Indium9.0E is an air reflow, no-clean solder paste specifically formulated to accommodate the higher processing temperatures required by the SnAgCu, SnAg, and other alloy systems favored by the electronics industry to replace conventional Pb-bearing solders. **Indium9.0E** offers unprecedented stencil print transfer efficiency to work in the broadest range of processes.

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 on the right.

Compatible Products
- Rework Flux: TACFlux® 020B, TACFlux® 089HF
- Cored Wire: CW-802, CW-807
- Wave Flux: WF-7745, WF-9945

Standard Product Specifications

Alloy		Metal Load	
		Type 3	Type 4/4.5
SAC387	95.5Sn/3.8Ag/0.7Cu	88.5%	88.0%
SAC305	96.5Sn/3.0Ag/0.5Cu		
SAC105	98.5Sn/1.0Ag/0.5Cu		
SAC0307	99Sn/0.3Ag/0.7Cu		

Packaging
Indium9.0E 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.

Storage and Handling Procedures
The shelf life of **Indium9.0E** is 6 months when stored at <10°C. Solder paste packaged in cartridges should be stored tip down.

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.

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BELLCORE AND J-STD TESTS & RESULTS

Test	Result
J-STD-004A (IPC-TM-650)	
• Flux Type (per J-STD-004A)	ROL0
• Flux Induced Corrosion (Copper Mirror)	Type L
• Presence of Halide Oxygen Bomb followed by Ion Chromatography	<50ppm Br^- <50ppm Cl^-
• SIR	Pass

Test	Result
J-STD-005 (IPC-TM-650)	
• Typical Solder Paste Viscosity Malcom (10 rpm)	1300 poise
• Slump Test	Pass
• Solder Ball Test	Pass
• Typical Tackiness	35g
• Wetting Test	Pass
BELLCORE GR-78	
• SIR	Pass
• Electromigration	Pass

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

Form No. 98714 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	25-200mm/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	Up to 12 hours (at 30-60% RH and 22-28°C)

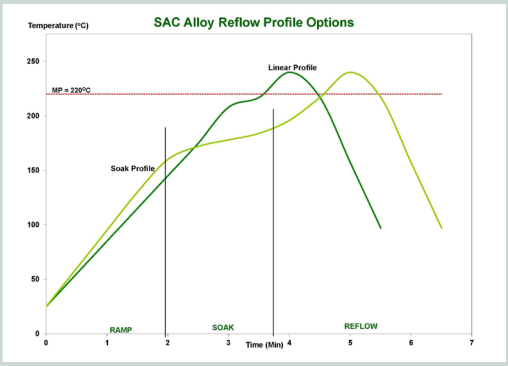
Cleaning

Indium9.0E 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:



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 **Indium9.0E** 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.

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

Reflow Profile Details	Parameters		Comments
	SAC305		
Ramp Profile (Average Ambient to Peak) - Not the Same as Maximum Rising Slope	0.5–1°C/Second Recommended	0.5–2.5°C/Second Acceptable	To minimize solder balling, beading, hot slump
Soak Zone Profile (Optional)	30–90 Seconds Recommended	30–120 Seconds Acceptable	May minimize BGA/CSP voiding
	160–180°C/Recommended	150–200°C/Acceptable	
Time Above Liquidus (TAL) Total Time & Temperature	45–60 Seconds Recommended	30–100 Seconds Acceptable	Needed for good wetting/reliable solder joint
	235–250°C/Recommended	232–270°C/Acceptable	
Cooling Ramp Rate	2–6°C/Second Recommended	0.5–6°C/Second Acceptable	Rapid cooling promotes fine grain structure
Peak Air Temperature	260°C		As measured with thermocouple
Reflow Atmosphere	Air or N_2		N_2 typically preferred

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