PRODUCT DATA SHEET

Indium10.1 (T6-MC)

Pb-Free Solder Paste

Introduction

Indium10.1 is an air or nitrogen reflow, no-clean solder paste specifically formulated to accommodate the higher processing temperatures required by SnAgCu and other Pb-free alloy systems favored by the electronics industry to replace Pb-bearing solders. **Indium10.1** (T6-MC) offers exceptional stencil print transfer efficiency to work in the broadest range of processes, including 008004 assembly. In addition, the high oxidation resistance of **Indium10.1** virtually eliminates incomplete coalescence (graping) of small deposits and the head-in-pillow defect. **Indium10.1** also offers extremely low, large ground-plane voiding found in QFN components.

Features

- Developed for 008004 processability
- High transfer efficiency and low variation through small apertures (≤0.5 AR)
- Eliminates the graping phenomenon
- Exceptional head-in-pillow resistance
- Outstanding RF shield metallization wetting
- Low-voiding on QFN, BGA, and CSP components

Alloys

Indium Corporation manufactures low-oxide spherical powder composed of a variety of Pb-free alloys that cover a broad range of melting temperatures. This document covers T6-MC powder sizes. 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 Specifications

Alloy	Metal Load*
SAC305	88% (T6-MC)
SAC387	

** The optimal metal loads are shown above. These can vary based upon geographic location and application/process needs.*

Bellcore and J-STD Tests and Results			
Flux Classification	ROL1	Typical Solder Paste Viscosity for SAC305 T6-MC (Poise)	1,750
Based on the testing required by the current revision of IPC J-Standard-004		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.

Complementary Products

- **Rework Flux**: TACFlux® 089HF, TACFlux® 020B-RC
- **Cored Wire**: CW-807, Core 230-RC
- **Wave Flux**: WF-9945, WF-9958

Other products may be applicable.
Please consult one of Indium Corporation's Technical Support Engineers.

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 2 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

Indium10.1 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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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 optimum transfer efficiency and release of the solder paste from the stencil apertures, industry standard aperture and aspect ratios should be adhered to.

Recommended Printer Operation

Solder Paste Bead Size	~20–25mm in diameter
Print Speed	25–50mm/second
Squeegee Pressure	0.018–0.027kg/mm of blade length
Underside Stencil Wipe	Start at once per every 6 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
Preliminary Solder Paste Stencil Life	Up to 4 hours (at 30–60% RH and 22–28°C)

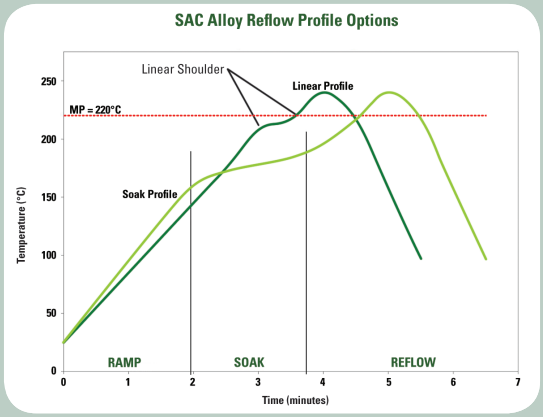
Cleaning

Indium10.1 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 non-water-based 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 **Indium10.1 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	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

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

Contact our engineers: askus@indium.com
Learn more: www.indium.com

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