PRODUCT DATA SHEET

Indium10.1HF Ultra-Low Voiding

Pb-Free Solder Paste

Introduction

Indium10.1HF is an air reflow, no-clean, halogen-free, Pb-free solder paste specifically formulated to have ultra-low voiding, including for designs that incorporate large ground pads otherwise known as bottom termination components (BTCs). BTCs include packages such as QFNs, DPAKs, and MOSFETs. The flux chemistry is specifically engineered to improve reliability by minimizing voiding and maximizing ECM and head-in-pillow performance while also providing excellent wetting, solder beading, solder balling, and slump to meet IPC specifications. It is compatible with lead-free alloys such as SnAgCu, SnAg, and other alloy systems favored by the electronics industry.

Features

- Ultra-low voiding, including bottom termination (BTC) assemblies
- High ECM performance under low standoff components
- Outstanding solder beading, very low bridging, slump, solder balling, and head-in-pillow
- Excellent wetting to fresh and aged common metallizations and surface finishes, including, but not limited to:
  - OSP
  - Immersion Sn
  - Immersion Ag
  - ENIG
- Exceptional printing — high transfer efficiency and low variation
- Halogen-free per IEC 61249-2-21, test method EN14582

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 3 and Type 4 powders are standard offerings with Pb-free 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 specifications table.

Standard Product Specifications

Alloy	Metal Load	Particle Size
96.5Sn/3.0Ag/0.5Cu 95.5Sn/3.8Ag/0.7Cu Indalloy®276	89% (Type 4) Printing	20µm – 38µm

Complementary Products

- Rework Flux: TACFlux®089HF
- Cored Wire: CW-807
- Wave Flux: WF-9945, WF-9958

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
<25°C	7 days

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

Indium10.1HF is currently available in 500g jars or 600g cartridges. Alternate packaging options may be available upon request.

Industry Standard Test Results and Classification			
Flux Classification	ROL0	Typical Solder Paste Viscosity for SAC305 T4 (Poise)	1900
Based on the testing required by IPC J-standard-004B.		Conforms with all requirements from IPC J-standard-005A.	
Halogen-free per IEC 61249-2-21, Test Method EN14582	<900 ppm Cl <900 ppm Br <1500 ppm Total		

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

OVER →

From One Engineer To Another®

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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.

Recommended 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	Up to 12 hours (at 30–60% RH and 22–28°C)

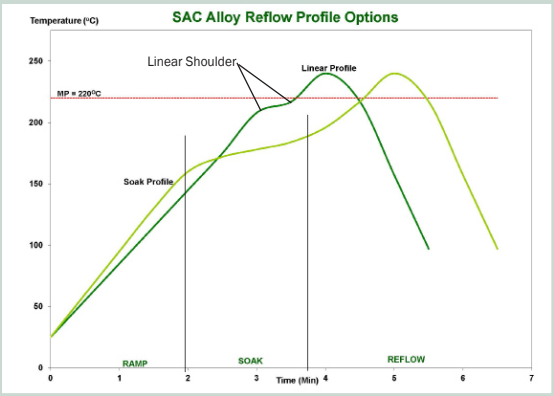
Cleaning

Indium10.1HF 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 **Indium10.1HF** 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
	160–180°C	150–200°C	
Time Above Liquidus (TAL)	45–60 Seconds	30–100 Seconds	Needed for good wetting/reliable solder joint
Peak Temperature	235–250°C	232–270°C	As measured with thermocouple
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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