PRODUCT DATA SHEET

Indium8.9HF

High-Reliability Solder Paste

Introduction

Indium8.9HF is an air reflow, no-clean solder paste formulated to accommodate the higher processing temperatures required by high-reliability alloy Indalloy®292 and other alloy systems favored by the electronics industry to replace conventional Pb-bearing solders. **Indium8.9HF** offers unprecedented stencil print transfer efficiency to work in the broadest range of processes. In addition, the high probe testability of **Indium8.9HF** minimizes false failures in ICT. It is an exceptional material for conformal coating compatibility.

Features

- Halogen-free per EN14582 test method
- One of our most stable pastes
- High transfer efficiency through small apertures (≤0.66AR)
- Eliminates hot and cold slump
- High oxidation resistance
- Wets well to oxidized BGA and pad surfaces
- Excellent soldering performance under high-temperature and long reflow processes
- Clear, probe testable flux residue

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 Type 4 powder as a standard offering with Indalloy®292. 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
Name	Composition	Type 4
Indalloy®292	Patent Pending	88.5%
Indalloy®276		
Indalloy®259		
Indalloy®133		
Indalloy®264		

Industry Standard Test Results and Classification			
Flux Classification	ROL0	Typical Solder Paste Viscosity for Indalloy®292 T4 (Poise)	1,440
Based on the testing required by IPC J-STD-004B.		Conforms with all requirements from IPC J-STD-005A.	
Halogen-free per IEC 61249-2-21, Test Method EN14582	<900ppm Cl <900ppm Br <1,500ppm Total		

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

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.

Complementary Products

- **Rework Flux**: TACFlux®089HF, TACFlux®020B-RC
- **Cored Wire**: CW-807 or Core 230-RC within the Indalloy®292C alloy
- **Wave Flux**: WF-9945, WF-9958

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

Packaging

Indium8.9HF 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.

Technical Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Materials Science as it applies to the electronics and semiconductor sectors, Technical Support Engineers provide expert advice in solder preforms, wire, ribbon, and paste. Indium Corporation's Technical Support Engineers provide rapid response to all technical inquiries.

Safety Data Sheets

Please refer to the SDS document within the product shipment, or contact our local team to receive a copy.

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 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	25–150mm/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; 45 or 60° squeegees are typically used
Separation Speed	5–20mm/second or per equipment manufacturer's specifications
Solder Paste Stencil Life	Up to 60 hours (at 30–60% RH and 22–28°C)

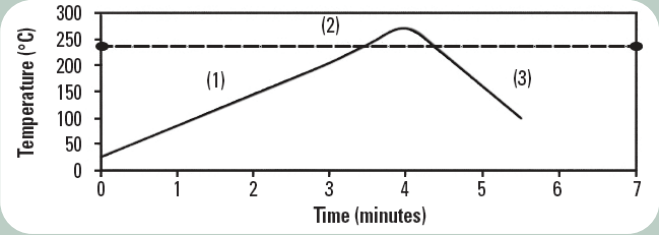
Cleaning

Indium8.9HF 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:



This can be used as a general guideline in establishing a reflow profile (the example above shows the use of **Indium8.9HF with Indalloy®292 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 a linear profile. If needed, a flat soak portion or a linear shoulder may be added to reduce the thermal gradient.

Reflow Profile Details	Recommended Parameters	Acceptable Parameters	Comments
Ramp Profile (Average Ambient to Peak)—Not the Same as Maximum Rising Slope	1.0–1.5°C/second	0.5–2.5°C/second	To minimize solder balling, beading, hot slump
Soak Zone Profile (Optional)	20–60 seconds	30–120 seconds	May minimize BGA/CSP voiding Eliminating/reducing the soak zone may help to reduce HIP and graping
	140–160°C	140–170°C	
Time Above Liquidus (TAL)	45–60 seconds	30–100 seconds	Needed for good wetting/reliable solder joint
Peak Reflow Temperature	Liquidus +20–30°C	Liquidus +15–40°C	
Cooling Rate	2–6°C/second	0.5–6.0°C/second	Rapid cooling promotes fine-grain structure
Reflow Atmosphere	N_2 preferred for small components		

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

All of Indium Corporation's solder paste and preform manufacturing facilities are IATF 16949:2016 certified.
Indium Corporation is an ISO 9001:2015 registered company.

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