PRODUCT DATA SHEET

Indium10.2HF

Pb-Free Solder Paste

Introduction

Indium10.2HF is a no-clean solder paste, specifically formulated for today's Pb-free (Sn-based) alloys for PCB assembly in nitrogen or air reflow. The flux residue is formulated to be hard and fast breaking, yet non-tacky after reflow, in order to provide extraordinary flying probe and in-circuit testing (ICT) performance. **Indium10.2HF** provides excellent head-in-pillow (HIP) and non-wet-open (NWO) resistance along with offering unprecedented stencil print transfer efficiency to work in the broadest range of processes.

Features

- Non-tacky fast break residue with excellent flying probe and ICT performance
- Excellent HIP and NWO performance
- Eliminates clogged apertures through advanced rheology
- Superior wetting
- High oxidation resistance
- Halogen-free per EN14582 test method

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 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 following table.

Standard Product Specifications

Alloy	Metal Load
	Type 4
95.5Sn/3.8Ag/0.7Cu (SAC387)	89%
96.5Sn/3.0Ag/0.5Cu (SAC305)	
98.5Sn/1.0Ag/0.5Cu (SAC105)	
99Sn/0.3Ag/0.7Cu (SAC0307)	

Compatible Products

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

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

Indium10.2HF 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.

BELLCORE and J-STD Tests & Results

Test	Result	Test	Result
J-STD-004 (IPC-TM-650)		**J-STD-005 (IPC-TM-650)**	
Flux Type (per J-STD-004A)	ROL0	Typical Solder Paste Viscosity Malcom (10rpm)	1650 poise
Flux Induced Corrosion (Copper Mirror)	Type L	Slump Test	Pass
Presence of Halide Oxygen Bomb Followed by Ion Chromatography	<50ppm Br- <50ppm Cl-	Solder Ball Test	Pass
SIR	Pass (>10^8, 85°C, 85% R.H.)	Typical Tackiness	43 grams
		Wetting Test	Pass
		BELLCORE GR-78	
All information is for reference only. Not to be used as incoming product specifications.		SIR	Pass
		Electromigration	Pass

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.

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	>8 hours (at 30–60% RH and 22–28°C)

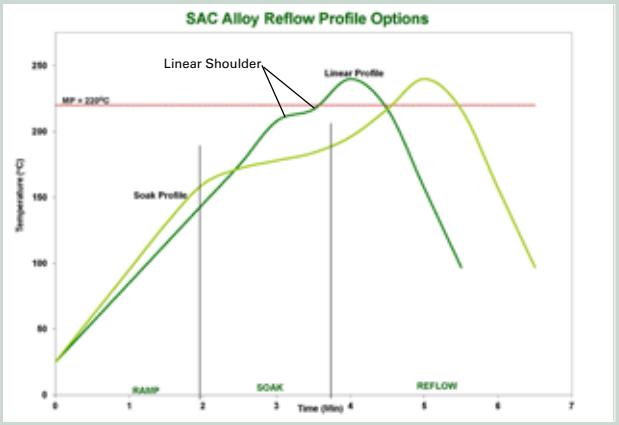
Cleaning

Indium10.2HF 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 **Indium10.2HF** 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 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

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