PRODUCT DATA SHEET

Indium5.7LT-1

Low-Temperature Solder Paste

Introduction

Indium5.7LT-1 is an air reflow, halogen-free, no-clean solder paste designed for assembly processes using eutectic SnBi and SnBiAg alloys. This paste is a clear residue product with exceptional wetting capabilities. The low activation temperature of **Indium5.7LT-1**, in combination with the SnBi alloy, can be especially useful as a low-temperature, Pb-free solution.

Features

- Formulated for use with eutectic 58Bi/42Sn and 57Bi/42Sn/1Ag alloys
- Low-temperature Pb-free solution
- Clear residue
- Exceptional wetting in air and nitrogen reflow
- Halogen-free per EN14582 test method

Alloys

Indium Corporation manufactures low-oxide spherical powder composed of the 58Bi/42Sn eutectic alloy in the industry standard Type 3 and Type 4 mesh sizes. Other non-standard mesh sizes are available upon request. The weight ratio of the flux/vehicle to the solder powder is referred to as the metal load and is typically in the range of 83–92% for standard alloy compositions.

Standard Product Specifications

Alloy	Metal Load		Mesh Size
	Printing	Dispensing	
Indalloy®281 (58Bi/42Sn)	89–90%	84%	Type 3
Indalloy®282 (57Bi/42Sn/1Ag)			
Indalloy®283 (57.6Bi/42Sn/0.4Ag)			
Indalloy®281 (58Bi/42Sn)	89–90%	84%	Type 4
Indalloy®282 (57Bi/42Sn/1Ag)			
Indalloy®283 (57.6Bi/42Sn/0.4Ag)			
Indalloy®281 (58Bi/42Sn)	88–89%	83%	Type 5-MC
Indalloy®282 (57Bi/42Sn/1Ag)			
Indalloy®283 (57.6Bi/42Sn/0.4Ag)			

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)	Preliminary Shelf Life
<10°C	3 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

Standard packaging for **Indium5.7LT-1** is 500g jars and 600g cartridges. For dispensing applications, 10cc and 30cc syringes are standard. Other packaging options may be available upon request.

Complementary Products

- Rework Flux: TACFlux®057

Industry Standard Test Results and Classification			
Based on the testing required by J-Standard-004 (IPC-TM-650)		Typical Solder Paste Viscosity for Eutectic Sn/Bi, Type 4 (Poise)	1,600Kcps
Presence of Halide Quantitative Halide Content	0%	Typical Tackiness	45g
Post Reflow Flux Residue (ICA Test)	<5% of solder paste	Conforms with all requirements from J-STD-005 (IPC-TM-650).	

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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).
- A minimum aspect ratio of 1.5 is suggested for adequate release of solder paste from stencil apertures. The aspect ratio is defined as the width of the aperture divided by the thickness of the stencil.

Printer Operation:

The following are general recommendations for stencil printer optimization. Adjustments may be necessary based on specific process requirements:

Recommended Printer Operation	
Solder Paste Bead Size	20–25mm in diameter
Print Speed	25–100mm/second
Squeegee Pressure	0.018–0.027Kg/mm of blade length
Underside Stencil Wipe	Once every 10–25 prints
Solder Paste Stencil Life	>8 hours @ 30–60% RH and 22–28°C

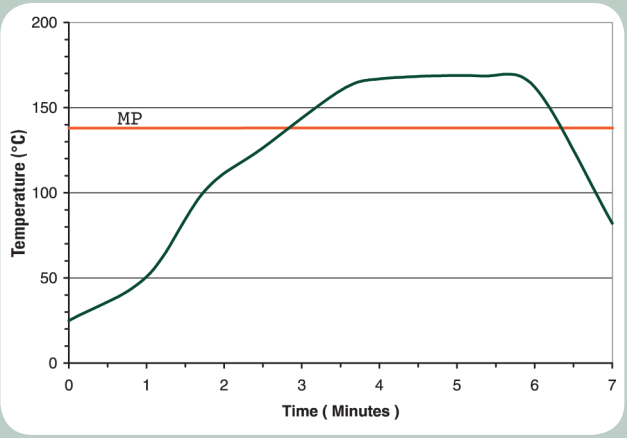
Cleaning

Indium5.7LT-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 an automated stencil cleaning system for both stencil and misprint cleaning to prevent extraneous solder balls. Most commercially available stencil cleaning formulations including isopropyl alcohol (IPA) work well.

Reflow

Recommended Profile:



This profile is designed for use with Indalloy®282 and can serve as a general guideline in establishing a reflow profile for use with other alloys. Adjustments to this profile may be necessary based on specific process requirements.

Heating Stage:

A linear ramp rate of 0.5–1°C/second allows gradual evaporation of volatile flux constituents and prevents defects such as solder balling/beading and bridging as a result of hot slump. It also prevents unnecessary depletion of fluxing capacity when using higher temperature alloys.

Liquidus Stage:

A peak temperature of 25–45°C (175°C shown) above the melting point of the solder alloy is needed to form a quality solder joint and achieve acceptable wetting due to the formation of an intermetallic layer.

Cooling Stage:

A rapid cool down is desired to form a fine grain structure. Slow cooling will form a large grain structure, which typically exhibits poor fatigue resistance. The acceptable cooling range is 0.5–6.0°C/second (2.0–6.0°C/second is ideal).

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