PRODUCT DATA SHEET

Indium3.1 Pb-Free
Water-Soluble Solder Paste

Features
- Exceptional printing
- Long stencil life
- Wide reflow profile window
- Outstanding slump resistance
- Excellent wetting compatibility
- Superior fine-pitch soldering ability
- Low voiding
- Low foam

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 powder is the standard offering with SnAgCu, SnAg and other Pb-free alloy systems. 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		Particle Size
Indalloy #241 95.5Sn/3.8Ag/0.7Cu Indalloy #256 96.5Sn/3.0Ag/0.5Cu Indalloy #121 96.5Sn/3.5Ag	Printing 88.5%	Dispensing 83%	25-45 µm 0.001-0.0018"

Packaging
Standard packaging for stencil printing applications includes 500g jars and 500g cartridges. Other packaging options may be available upon request.

Storage and Handling Procedures
Refrigerated storage will prolong the shelf life of solder paste. The shelf life of **Indium3.1** is no less than 4 months when stored at less than 10°C.

Solder paste should be allowed to reach ambient working temperature prior to use (about 4-6 hours). Actual time to reach thermal equilibrium will vary with container size. Paste temperature should be verified before use. Use paste within 8 hours of exposure to atmosphere. Jars and cartridges should be labeled with date and time of opening.

When storing solder paste contained in syringes and cartridges, the solder paste should be stored with the tip down.

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

Safety Data Sheets
The SDS for this product can be found online at http://www.indium.com/sds

OVER→

BELLCORE AND J-STD TESTS & RESULTS

Test	Result
J-STD-004A* (IPC-TM-650)	
• Flux Type (per J-STD-004A)	ORM1
• Flux Induced Corrosion	M
• Presence of Halide	
Silver Chromate	Pass
Fluoride Spot Test	Pass
Quantitative Halide Content	<5000 ppm
• SIR (cleaned)	Pass

Test	Result
J-STD-005 (IPC-TM-650)	
• Typical Solder Paste Viscosity	
SAC387 (Sn95.5/Ag3.8/Cu0.7, Type 3, 89%)	
SAC305 (Sn96.5/Ag3/Cu0.5, Type 3, 88.5%)	
Malcom (10 rpm),	1950 poise
• Typical Tackiness	35g
• Slump Test	Pass
• Solder Ball Test	Pass

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

**J-STD-004A has replaced J-STD-004 and is more stringent in its requirements.*

Form No. 97890 (A4) R9

www.indium.com askus@indium.com

ASIA: Singapore, Cheongju, Malaysia: +65 6268 8678
CHINA: Suzhou, Shenzhen: +86 (0)512 628 34900
EUROPE: Milton Keynes, Torino: +44 (0) 1908 580400
USA: Utica, Clinton, Chicago, Rome: +1 315 853 4900

INDIUM CORPORATION®

ISO 9001 REGISTERED

Indium3.1 Pb-Free Water-Soluble Solder Paste

Printing

The sharp print definition of **Indium3.1** is ideal for fine- pitch applications. The unprecedented stencil life of this water-soluble product virtually eliminates waste of solder paste.

Printer Operation:

The following are general recommendations for stencil printer optimization for **Indium3.1**. Adjustments may be necessary based on specific process requirements:

- Solder Paste Bead Size: 20-25mm diameter
- Print Speed: 25-100mm/sec
- Squeegee Pressure: 0.018-0.027kg/mm of blade length
- Underside Stencil Wipe: Once every 10-25 prints or as necessary
- Solder Paste Stencil Life: >8 hrs. @ 20-50% RH & 22-28°C

  ~4 hrs. @ 50-70% RH & 22-28°C

Wetting

Indium3.1 exhibits excellent wetting under both air and nitrogen reflow atmosphere. The solder joints yielded are shiny and smooth, including those of ultra fine-pitch components. **Indium3.1** has low voiding performance, including joints of BGAs and CSPs.

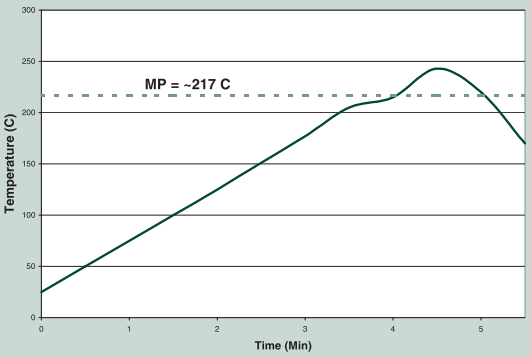
Cleaning

Residue Cleaning: Indium3.1 residue is easily cleaned with water at no less than 60 psi and 55°C. The optimal spray pressure and temperature are a function of the board complexity and the efficiency of cleaning equipment.

Stencil Cleaning: This is best performed using an automated stencil cleaning system for both stencil and misprint cleaning to prevent extraneous solder particles. Most commercially available stencil cleaners and isopropyl alcohol (IPA) work well.

Reflow

Recommended Profile:



The above reflow profile was designed to serve as a starting point for process optimization using **Indium3.1**. When seeking to minimize thermal gradient or reduce voiding in BGA assemblies, a profile utilizing a soak of up to 2 minutes at 205-210°C may help.

Heating Stage:

A linear ramp rate of approximately 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 10-35°C (240°C shown) above the melting point (217°C) of the solder alloy is needed to form a quality solder joint and achieve acceptable wetting due to the formation of an intermetallic layer. If the peak temperature is excessive, or the time above liquidus is greater than the recommended 30-90 seconds, flux charring, excessive intermetallic formation, and damage to the board and components can occur.

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°C-6.0°C/second (2.0°-6.0°C/second is ideal).

www.indium.com askus@indium.com

ASIA: Singapore, Cheongju, Malaysia: +65 6268 8678
CHINA: Suzhou, Shenzhen: +86 (0)512 628 34900
EUROPE: Milton Keynes, Torino: +44 (0) 1908 580400
USA: Utica, Clinton, Chicago, Rome: +1 315 853 4900

INDIUM CORPORATION®

ISO 9001 REGISTERED