Product Data Sheet

Wafer Pastes

Features

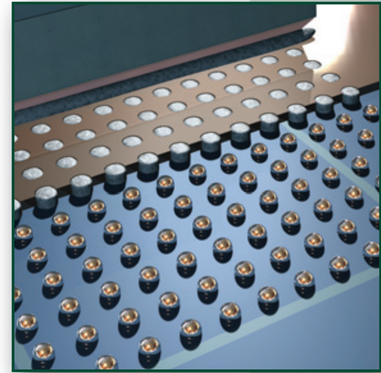
- Ultra fine-pitch printing
- Compatible with all common Sn/Pb and Pb-Free Alloys
- Consistent volume deposition
- Superior yields
- Excellent paste release
- Smooth and shiny joint appearance

Introduction

Indium Corporation's **Wafer Pastes** are a nitrogen reflow, no-clean solder pastes using Type 5 and Type 6 powder, which are specifically formulated for flip-chip attachment and CSP and wafer bumping applications. The flux is formulated so that it is applicable to Sn/Ag and Sn/Ag/Cu alloy systems. SnPb is also available. These products provide consistent volume deposition, low solder balling, and high yields. If cleaning is needed, the flux residue may be removed with commercially available cleaners.

Alloys

Indium Corporation provides Sn/Pb and Pb-Free solder powder to be compatible with the flux vehicle and to deliver excellent stencil release for ultra fine-pitch printing for flip chip attachment and CSP and wafer bumping applications. Other alloys are available for use in wafer bumping applications. Alloys are also available for solder paste that may be difficult or impossible to deposit by electroplating. The weight ratio of the solder powder and solder paste is typically in the range of 89-89.5% to deliver the required bump height. The standard product specifications are listed below.



Packaging

Standard packaging for stencil printing applications includes 500g jars and 600g cartridges. Packaging for enclosed print head systems is also readily available. For dispensing applications, 10cc and 30cc syringes are standard. 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 Indium Corporation's **Wafer Pastes** is 3 months when stored at <5°C. Solder paste packaged in syringes and cartridges should be stored with the tip down.

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.

Standard Product Specifications

OVER→

Product	Alloy	Metal Load	Mesh Size	Particle Size
CP-5241	95.5Sn/3.8Ag/0.7Cu	89-89.5%	Type 5	15-25 µm
CP-5246	95.5Sn/4.0Ag/0.5Cu			
CP-5256	96.5Sn/3.0Ag/0.5Cu			
CP-5121	96.5Sn/3.5Ag			
CP-5106	63Sn/37Pb			
CP-6241	95.5Sn/3.8Ag/0.7Cu	89-89.5%	Type 6	5-15 µm
CP-6246	95.5Sn/4.0Ag/0.5Cu			
CP-6256	96.5Sn/3.0Ag/0.5Cu			
CP-6121	96.5Sn/3.5Ag			
CP-6106	63Sn/37Pb			

J-STD TESTS & RESULTS

Test	Result
• Flux Type Classification	ROL1
• Flux Induced Corrosion (Copper Mirror)	Pass
• Presence of Halide	
Silver Chromate	Pass
Fluoride Spot Test	Pass
• Corrosion	Pass
• SIR	Pass

Test	Result
• Acid Value	99.6
• Typical Viscosity	Brookfield (5 rpm) 1150 Kcps
• Typical Tackiness	2g/mm²
• Solder balling	Pass
• Solid Content	6.7
• Post Reflow Flux Residue (ICA Test)	42%

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

Form No. 97739 (A4) R5

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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:

- For wafer bumping, various stencil designs can produce the desired final bump height. The following examples can be used as a guideline for 20mil pitch bumps:

Aperture Opening	Stencil Thickness	Aperture Shape	Reflowed Bump Height
8mil	10mil	Square	7.6mil
9mil	10mil	Square	8.4mil
10mil	10mil	Square	8.8mil

- 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 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 adequate release of solder paste from stencil aperatures, a minimum aspect ratio of 1.5 is required. 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 requirement:

- 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
- Solder Paste Stencil Life: >8 hrs. @ 30-60% RH & 22°-28°C

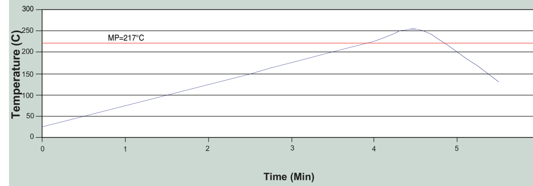
Cleaning

Device cleaning post reflow, tools and stencils: this is best performed using a commercially available aqueous inline cleaning system.

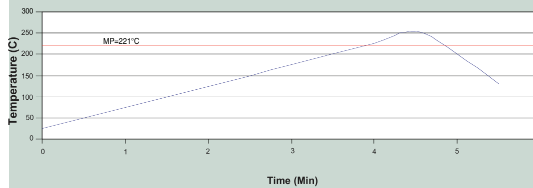
Reflow

Recommended Profiles:

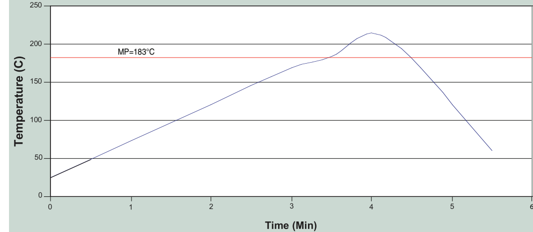
CP-5241/6241, CP-5246/6246, CP-5256/6256



CP-5121/6121



CP-5106/6106



The reflow profiles are designed for use with Sn/Ag and Sn/Ag/Cu alloys. Adjustments to these profiles may be necessary based on specific process requirements and alloys with different melting temperatures.

Material Safety Data Sheets

The MSDS for this product can be found online at http://www.indium.com/techlibrary/msds.php

This product data sheet is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices.

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