

PRODUCT DATA SHEET

Wafer Pastes

Introduction

Indium Corporation's **Wafer Pastes** are nitrogen reflow, no-clean solder pastes using Type 5 and Type 6 powders, which are specifically formulated for flip-chip attachment and CSP and wafer bumping applications. The flux is formulated so that it is applicable to SnAg and SnAgCu 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.

Features

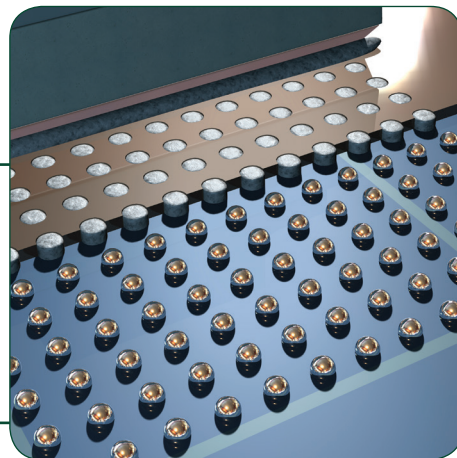
- Ultrafine-pitch printing
- Compatible with all common SnPb and Pb-free alloys
- Consistent volume deposition
- Superior yields
- Excellent paste release
- Smooth and shiny joint appearance

Alloys

Indium Corporation provides SnPb and Pb-free solder powder to be compatible with the flux vehicle and to deliver excellent stencil release for ultrafine-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 89.0–89.5% to deliver the required bump height. The standard product specifications are listed below.

Standard Product Specifications

Product	Alloy	Metal Load	Mesh Size	Particle Size
CP-5241	95.5Sn/3.8Ag/0.7Cu	89.0–89.5%	Type 5	15–25µm
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	89.0–89.5%	Type 6	<20µm
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 and Results

Test	Result
Flux Type Classification	ROL1
Flux Induced Corrosion (Copper Mirror)	Pass
Presence of Halide – Silver Chromate – Fluoride Spot Test	Pass Pass
Corrosion	Pass
SIR	Pass
Acid Value	99.6
Typical Viscosity	Brookfield (5rpm) 1,150kcps
Typical Tackiness	2g/mm ²
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.

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, 10 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 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.



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:

- 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 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 adequate release of solder paste from stencil apertures, 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 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

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

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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.

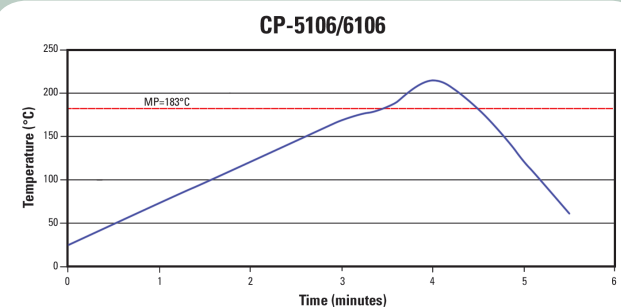
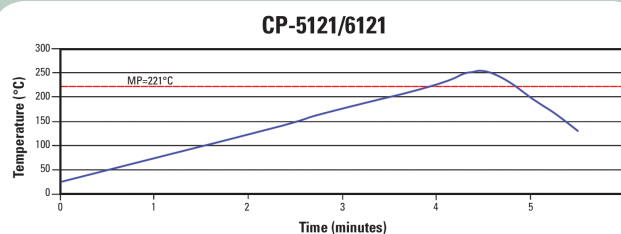
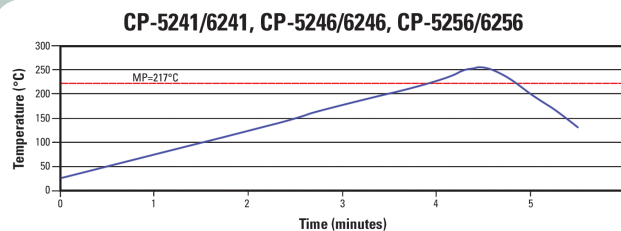
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Reflow

Recommended Profile:



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

Technical Support

Indium Corporation sets the industry standard in providing rapid response, onsite technical support for our customers worldwide. Indium Corporation's team of Technical Support Engineers can provide expertise in all aspects of Materials Science and Semiconductor Packaging process applications.

Safety Data Sheets

The SDS for this product can be found online at <http://www.indium.com/sds>



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