PRODUCT DATA SHEET

Indium7.16 BiAgX®

High-Temperature Pb-Free Printing Solder Paste

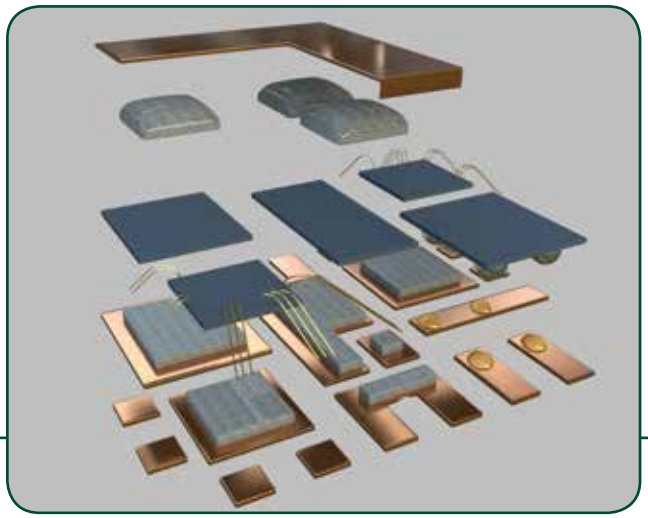
Introduction

BiAgX® is a true solder paste technology. It reflows, solders, wets, and solidifies, just like any other solder paste. When converting from a standard high-Pb solder paste-based process, minimal process adjustments are required, eliminating the need for new capital expenditure.

Solder joints made with **BiAgX®** will work well even in high-temperature environments in excess of 150°C, with minimal degradation of the final joint mechanical structure and little or no deterioration in electrical and thermal performance. It contains no costly specialty materials, such as nanoparticles or gold.

BiAgX® is suited to smaller die and lower voltage applications, such as those used in QFN packages for portable, automotive, and industrial electronics. **BiAgX®** is available in both dispense **(Indium7.08)** and printing **(Indium7.16)** solder pastes.

BiAgX® is evolving into a family of products, all based around a platform technology and is a patent-pending and trademarked product of Indium Corporation.



Features

- Drop-in replacement for high Pb-containing solder paste
- Pb-free (lead-free) and Sb-free (antimony-free)
- Flux cleanable with standard cleaning chemistries and processes
- Requires no pressure on the die during reflow
- No costly specialty materials

Although other products are currently under development, such as higher temperature versions, the current BiAgX® offering is either **Low Ag** (silver) or **High Ag**. The **Low Ag** is the standard and lower cost material. Although the **High Ag** material may show slightly higher voiding than the standard **Low Ag** BiAgX®, it has shown applicability in certain niche applications.

Solder Paste Description	Status	Application	General Use	Solidus (Final Joint)
Low Ag BiAgX® Indium7.XX	Released product	Standard die-attach material	High-Pb solder replacement	262°C
High Ag BiAgX® Indium7.XX	Released product	Standard die-attach material; some SMT uses	High-Pb solder replacement with higher bond strength than low Ag; very thin Sn (<5 microns) coatings on components	262°C

IPC Tests & Results

Test	Result	Test	Result
J-STD-004 (IPC-TM-650)		**J-STD-005 (IPC-TM-650)**	
Flux Type (per J-STD-004A)	ROH0	Typical Solder Paste Viscosity (Type 4, 91%) Malcom (5min/10rpm)	980 poise
Presence of Halide	0%	Wetting Test	Pass
Fluoride Spot Test	Pass	Slump Test	Pass
Post Reflow Flux Residue	<1.5% of solder paste	Solder Ball Test	Pass
SIR	Pass (after cleaning)	Tack (typical)	60 grams
Acid Value	105 (flux)		
All information is for reference only. Not to be used as incoming product specifications.			

From One Engineer To Another®

INDIUM CORPORATION®

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Indium7.16 BiAgX® Printing Solder Paste

Alloys

Indium Corporation manufactures low-oxide spherical powder in standard Type 4 mesh size. Other sizes are available upon request.

Standard Printing Powder Specifications

Metal Content	Particle Size
Type 4	Type 4
91%	25 to 38µm

Packaging

Packaging is usually in jars or cartridges, and other options are available upon request.

Storage and Handling Procedures

Refrigerated storage will prolong the shelf life of solder paste. The shelf life of **Indium7.16 BiAgX®** is 6 months at storage temperatures of -15°C to 0°C. When storing solder paste contained in cartridges, they should be stored tip down. Solder paste should be allowed to reach ambient working temperature prior to use. No heating should be employed.

Generally, paste should be removed from refrigeration at least 4 hours before use. Actual time to reach thermal equilibrium will vary with container size. Paste temperature should be verified before use. Cartridges should be labeled with date and time of removal from controlled storage.

Cleaning

Indium7.16 BiAgX® is designed to be cleaned using standard cleaning chemistries. Indium Corporation's Technical Support Engineers can recommend appropriate cleaning materials from leading suppliers that are suitable for the application.

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. For optimum transfer efficiency and release of the solder paste from the stencil apertures, industry standard aperture and aspect ratios should be adhered to.

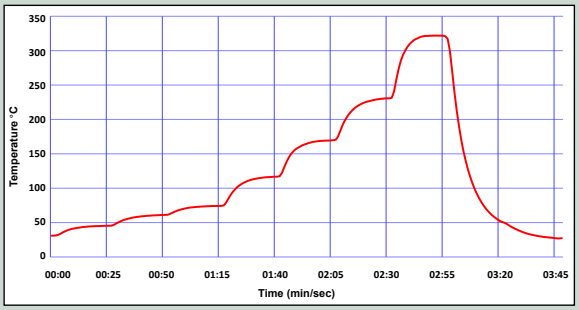
Printer Operation:

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

- Solder Paste Bead Size: 20–30mm diameter
- Print Speed: 12–100mm/sec
- Squeegee Pressure: 0.02–0.03kg/mm of blade length
- Underside Stencil Wipe: Start at once every 5 prints then decrease frequency until an optimum value is determined
- Solder Paste Stencil Life: >8 hours

Reflow

Recommended Profile:



The profile above is designed for use with **BiAgX®** in a nitrogen atmosphere or forming gas (<100ppm O_2). It can serve as a general guideline for establishing a profile for your process and should be regarded as a typical example. Adjustments to this profile may be necessary based on assembly size, thermal density, and other factors.

Cooling Stage:

Cooling after the reflow spike should be as fast as practical. This is desired to form a fine-grained metallic structure.

Contact our engineers today: askus@indium.com
Learn more: www.indium.com

ASIA +65 6268 8678 • CHINA +86 (0) 512 628 34900 • EUROPE +44 (0) 1908 580400 • USA +1 315 853 4900

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