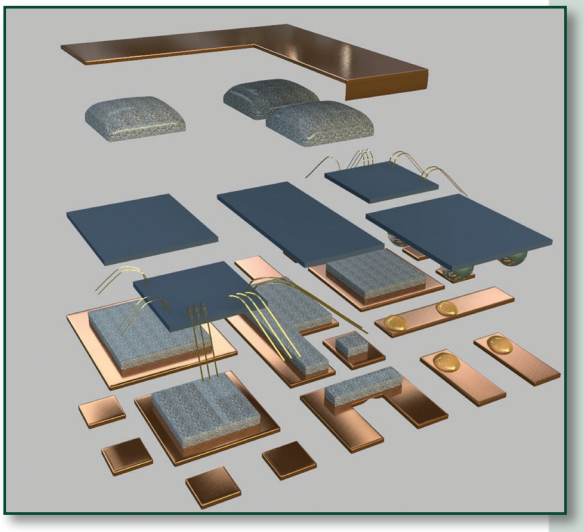
PRODUCT DATA SHEET

Indium7.08 BiAgX®

High-Temperature Pb-Free Dispensing Solder Paste



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

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.

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

OVER→

IPC TESTS & RESULTS

Test	Result
J-STD-004 (IPC-TM-650)	
• Flux Type (per J-STD-004A)	ROH0
• Presence of Halide	0%
• Fluoride Spot Test	Pass
• Post Reflow Flux Residue	<1.5% of solder paste
• SIR	Pass (after cleaning)
• Acid Value	105 (flux)

Test	Result
J-STD-005 (IPC-TM-650)	
• Typical Solder Paste Viscosity (Type 4, 88%) Malcom (5 min/10rpm)	460 poise
• Wetting Test	Pass
• Solder Ball Test	Pass
• Tack (typical)	55 g

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

Form No. 98919 (A4) R5

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Indium7.08 BiAgX® Dispensing Solder Paste

Alloys

Indium Corporation manufactures low-oxide spherical powder in standard Type 3 and Type 4 mesh sizes. Other sizes are available upon request.

Standard Dispensing Powder Specifications

Metal Content		Particle Size	
Type 4	Type 5	Type 4	Type 5
88%	87%	25 to 38µm	20 to 25µm

Packaging

Packaging is usually in 30 cc syringes, but other syringe options are available upon request. Airless (bubble-free) packaging is standard for syringe dispense.

Storage and Handling Procedures

Refrigerated storage will prolong the shelf life of solder paste. The shelf life of **Indium7.08 BiAgX®** is 6 months at storage temperatures of <10°C. Solder paste contained in syringes 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 four hours before use. Actual time to reach thermal equilibrium will vary. Paste temperature should be verified before use.

Cleaning

Indium7.08 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.

Dispensing

Indium7.08 BiAgX® at 88%w/w metal loading for type 4 and 87% for 5 powders is designed for general dispense purposes. The appropriate dispense parameters will depend on the required solder paste dot size, dispense frequency and needle/dispense-nozzle design, as well as the dispense equipment type [time/pressure (TP) or auger]. As a general guideline, do not exceed (that is, do not use a higher gauge number) than 23 gauge for type 3 paste or 25 gauge for a type 4. The critical parameter here is the inner diameter (ID) of the needle:

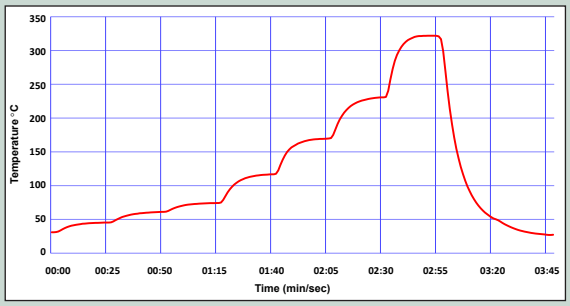
For TP dispense, begin with a pressure of 15psig (~100kPa) and a dispense time of 100ms. A pressure over 45psig (~300kPa) is considered excessive, and a lower needle gauge number may need to be selected (larger ID).

For auger dispense, begin with a slow auger rotation speed and large auger-casing distance, to minimize particle damage and allow more laminar flow of paste.

Needle Gauge	Needle ID		Approximate Smallest Dot Volume		
	inch	microns	$inch^3$	cm^3	mm^3
22	0.016	406	1.10E-06	1.8E-05	1.8E-02
23	0.013	330	5.70E-07	9.3E-06	9.3E-03
25	0.010	254	2.50E-07	4.1E-06	4.1E-03

Reflow

Recommended Profile:



The profile above is designed for use with **BiAgX®** in a nitrogen atmosphere or forming gas (<100 ppm 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.

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