

## PRODUCT DATA SHEET

# Gold-Tin (AuSn) Solder Paste

### Introduction

**AuSn Solder Paste** is generally used in applications that require a high-melting temperature (over 150°C), good thermal fatigue properties, and high-temperature strength. It is also used in applications that require high tensile strength and high corrosive resistance, and in step soldering applications where the paste will not melt during a subsequent low-temperature reflow process. For these reasons, **AuSn Solder Paste** is widely used in military, aerospace, high-power LED, and medical applications.

### Features

- High-temperature strength, high-melting point solder
- Corrosion resistant
- Compatible with other precious metals
- Superior thermal conductivity
- RoHS-compliant

### AuSn Alloy Options

- 80Au20Sn
- 79Au21Sn
- 78Au22Sn
- 77Au23Sn

### Flux Vehicles for AuSn Solder Paste

- RMA-SMQ51A
- RMA-SMQ51AC
- NC-SMQ51SC
- Indium3.2
- Indium10.8HF

Heat-stabilized flux vehicles for **AuSn Solder Paste** are available in both water-wash, no-clean, and RMA formulations according to the desired method of application and end use of customer. Product data sheets for these fluxes can be found within the product shipment, or contact our local team to receive a copy.

### Particle Size

**AuSn Solder Paste** is available in powder sizes 2 to 7 SGS (see list below). Metal loadings vary from 91–94% according to the intended application method and particle size. Please speak to an Indium Corporation Applications Engineer to determine the best product specification for your needs.

#### Powder Capabilities:

- Type 2 (-200/+325)
- Type 3 (-325/+500)
- Type 4 (-400/+635)
- Type 5 (-500/+635)
- Type 6 (-635)
- Type 6 SGS (5–15µm w/less than 10% overs/unders)
- Type 7 SGS (2–11µm w/less than 10% overs/unders)



### Packaging

**AuSn Solder Paste** is available in jars or syringes. Standard packaging for dispensing applications include 10 and 30cc syringes. Other packaging options are available upon request.

### Storage and Handling Procedures

Solder paste should be stored refrigerated for maximum shelf life. The precise shelf life of **AuSn Solder Paste** is dependent upon the flux vehicle used. Syringes or cartridges should be stored tip down to prevent excessive flux separation.

Solder paste should be allowed to reach ambient working temperature prior to use. Generally, paste should be removed from refrigeration at least 4 hours before use. Actual time to reach thermal equilibrium will vary with container size. Do not use heat to quicken this process. Paste temperature should be verified before use. Syringes or cartridges should be labeled with the date and time of first use.

### Dispensing

**AuSn Solder Paste** is formulated for automated high-speed, high-reliability, or single- or multi-point dispensing equipment. It also functions well in hand-held applications. Highly accurate volumes can be dispensed using either pneumatic or positive displacement devices. Optimal dispensing performance is dependent on storage conditions, equipment type, and setup.

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## Heating and Cooling Stages

### Heating Stage (1):

A linear ramp rate of 1–2°C/second allows gradual evaporation of volatiles and helps minimize 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 (2):

A minimum peak temperature of 40–50°C above the melting point of the solder alloy is usually needed to achieve excellent wetting and spread to form a quality solder joint. The time above liquidus (TAL) should be 45–90 seconds. A peak temperature and TAL above these recommendations can result in excessive intermetallics formation that can decrease solder joint reliability and lead to increased difficulty in repair on precious metal surfaces. A ramp rate of 2.5–3.5°C/second from liquidus to peak temperature is recommended.

### Cooling Stage (3):

This stage refers to the temperature range from peak temperature to approximately 50°C below the liquidus temperature where the cooling rate has a negligible effect. A rapid cool down of <4°C/second is desired to form a fine-grain structure. Slow cooling will form a large-grain structure, which typically exhibits poor fatigue resistance. If excessive cooling of >4°C/second is used, both the components and the solder joint can be stressed due to a high CTE mismatch.

## Post-Solder Cleaning

Post-solder cleaning can be accomplished using a recognized flux removal system. The high process temperatures encountered when using **AuSn Solder Paste** requires that the selected cleaning system is robust as residues will be hard and baked on. Simple unblended chemicals—such as isopropyl alcohol (IPA) or topical sprays—are unlikely to be successful.

## Supporting Data

Full alloy specifications for **AuSn** alloy options are available on the *Eutectic Gold-Tin Solder* (Form No. 97800) and *Off-Eutectic AuSn Alloys* (Form No. 99824) product data sheets.

## Technical Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Materials 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.

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. All Indium Corporation's products and solutions are designed to be commercially available unless specifically stated otherwise.

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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