

## PRODUCT DATA SHEET

# AuLTRA™ 5.1LS

## Low-Slump AuSn No-Clean Solder Paste

### Introduction

**AuLTRA™ 5.1LS** is an air or nitrogen reflow, AuSn no-clean solder paste specifically formulated and proven to maintain a low-slump profile throughout the printing process as well as during reflow preheating. While continuing to be able to accommodate the higher processing temperatures required by the Au-based alloy, **AuLTRA™ 5.1LS** has confirmed resistance to both hot and cold slump. Ideal for use in high-power LED module array assembly applications, this product formulation offers a wide processing window and consistent print definition, including ultrafine-pitches. In addition to consistent printing and reflow requirements, **AuLTRA™ 5.1LS** offers superb wetting.



### Features

- Excellent resistance to hot and cold slump
- Ideal for use in high-power LED module array assembly applications
- Exceptional wetting in air reflow
- Low voiding
- Wide reflow process window
- Consistent fine-pitch print deposition
- Superior tack strength
- No-clean residue
- Long open life, reduced waste

### AuSn Alloy Options

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

### Particle Size

**AuLTRA™ 5.1LS** is available in powder sizes 2 to 7 SGS (see list below). Metal loadings vary from 89–94% 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

**AuLTRA™ 5.1LS** 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

Refrigerated storage will prolong the shelf life of solder paste. The shelf life of **AuLTRA™ 5.1LS** is 6 months when stored at <10°C. Storage temperatures should not exceed 25°C. When storing solder paste contained in syringes and cartridges, they should be stored 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.

### Dispensing

**AuLTRA™ 5.1LS** 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.

### 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 preforms, wire, ribbon, and paste. Indium Corporation's Technical Support Engineers provide rapid response to all technical inquiries.

### Safety Data Sheets

Please refer to the SDS document within the product shipment, or contact our local team to receive a copy.

**From One Engineer To Another®**



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## Heating and Cooling Stages

### Heating Stage (1):

A linear ramp rate of 0.5–1°C/second allows gradual evaporation of volatile flux constituents and prevents 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 peak temperature of 25–45°C (215°C shown) above the melting point of the solder alloy is needed to form a quality solder joint and achieve acceptable wetting due to the formation of an intermetallic layer. If the peak temperature is excessive, or the time above liquidus greater than the recommended 45–90 seconds, flux charring, excessive intermetallic formation, and damage to the board and components can occur.

### Cooling Stage (3):

A rapid cool down of <4°C/second is desired to form a fine-grain structure in the solder joint. Slow cooling will form a large-grain structure, which typically exhibits poor fatigue resistance. If excessive cooling (>4°C/second) is used, both the components and the solder joint can be stressed due to a high CTE mismatch.

## 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:

- Discrete components—A 10–20% reduction in stencil aperture area may significantly reduce or eliminate 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).
- A minimum aspect ratio of 1:5 is suggested for adequate release of solder paste from stencil apertures. The aspect ratio is defined as the width of the aperture divided by the thickness of the stencil.

## Recommended Printer Operation

Solder Paste Bead Size	20–25mm in diameter
Print Speed	25–50mm/second
Squeegee Pressure	0.018–0.027kg/mm of blade length
Underside Stencil Wipe	Once per every 10–25 prints
Solder Paste Stencil Life	>8 hours (at 30–60% RH and 22–28°C)

## Cleaning

### Residue Removal

AuLTRA™ 5.1LS is designed for no-clean applications; however, the flux can be removed, if necessary, by using a commercially available flux residue remover.

### Stencil Cleaning

This is best performed using an automated stencil cleaning system for both stencil and misprint cleaning to remove extraneous solder particles. Most commercially available non-water-based stencil cleaners and isopropyl alcohol are acceptable.

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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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