

## Alpha 89.8-3-M18

# Instruction Manual: WS-809 Water-Soluble Solder Paste

Model: 89.8-3-M18 | Brand: Alpha

## 1. INTRODUCTION

This manual provides essential information for the safe and effective use of Alpha WS-809 Water-Soluble Solder Paste. Please read this manual thoroughly before use to ensure optimal performance and safety.

## 2. PRODUCT OVERVIEW

The Alpha WS-809 is a high-quality water-soluble solder paste, specifically formulated with Sn63Pb37 alloy. It is designed for use in the assembly of Printed Circuit Boards (PCBs) across various applications, including handheld electronic devices, computers, consumer electronics, network servers, automotive systems, medical equipment, and military equipment.



Figure 1: Alpha WS-809 Water-Soluble Solder Paste, showing both jar and tube packaging options. The jar is labeled "ALPHA Solder Paste" with "NO-CLEAN" visible, and the tube also has similar branding.

## 2.1 Key Features

- **Alloy Composition:** Sn63Pb37 (Tin 63%, Lead 37%)
- **Type:** Water-Soluble
- **Packaging:** Available in 500g Jar (as per product details)
- **Application:** Suitable for a wide range of PCB assembly processes.

## 3. STORAGE AND HANDLING

Proper storage and handling are crucial for maintaining the quality and performance of WS-809 solder paste.

### 3.1 Storage Recommendations

- Store in a cool, dry environment, ideally refrigerated at 0-10°C (32-50°F).
- Keep containers tightly sealed to prevent moisture absorption and solvent evaporation.
- Do not freeze the solder paste.

### 3.2 Handling Precautions

- Allow the solder paste to reach room temperature (20-25°C / 68-77°F) for at least 4 hours before use. Do not force warm.
- Stir the paste gently before use to ensure homogeneity, especially after prolonged storage.
- Use appropriate personal protective equipment (PPE), including gloves and eye protection, when handling.
- Avoid direct skin contact and inhalation of fumes. Work in a well-ventilated area.

## 4. OPERATING INSTRUCTIONS

Follow these guidelines for optimal application and reflow of WS-809 solder paste.

### 4.1 Application

WS-809 solder paste is typically applied using stencil printing. Ensure the stencil is clean and properly aligned with the PCB pads.

- **Stencil Type:** Stainless steel or nickel stencils are recommended.
- **Squeegee Speed:** Adjust speed based on stencil aperture size and paste viscosity, typically 25-100 mm/sec.
- **Print Pressure:** Apply sufficient pressure to ensure clean wipe of the stencil, avoiding excessive pressure that can cause paste bleed.
- **Ambient Conditions:** Maintain a controlled environment with temperature between 20-25°C (68-77°F) and relative humidity between 40-60%.

### 4.2 Reflow Profile

A proper reflow profile is critical for achieving strong solder joints and minimizing defects. The following is a general guideline; specific profiles may vary based on oven type, PCB design, and component mass.

- **Preheat Zone:** Gradually increase temperature from room temperature to 150-180°C (302-356°F) over 60-120 seconds. This activates the flux and evaporates solvents.
- **Soak Zone:** Maintain temperature between 180-200°C (356-392°F) for 60-90 seconds. This allows temperature equalization across the PCB.
- **Reflow Zone:** Peak temperature should be 215-225°C (419-437°F) for 20-40 seconds above liquidus (183°C for

Sn63Pb37).

- **Cooling Zone:** Rapid cooling is recommended to achieve fine grain structure and strong joints, typically 3-6°C/second.

## 5. POST-REFLOW CLEANING

As a water-soluble solder paste, WS-809 residues are designed to be easily removed with deionized water.

- **Cleaning Method:** Spray or immersion cleaning with deionized water at 40-60°C (104-140°F).
- **Rinse Time:** Typically 2-5 minutes, depending on residue amount and cleaning equipment.
- **Drying:** Ensure PCBs are thoroughly dried after cleaning to prevent corrosion.

## 6. MAINTENANCE AND DISPOSAL

### 6.1 Equipment Maintenance

Regular cleaning of stencil printing equipment and reflow ovens is essential to prevent contamination and ensure consistent performance. Clean stencils immediately after use to prevent paste drying in apertures.

### 6.2 Disposal

Dispose of unused solder paste and contaminated materials in accordance with local, state, and federal environmental regulations. Consult the product's Safety Data Sheet (SDS) for specific disposal information.

## 7. TROUBLESHOOTING

Common issues and their potential solutions when working with solder paste:

Problem	Possible Cause	Solution
Solder Balls	Excessive preheat, too rapid heating, insufficient drying, poor stencil release.	Adjust preheat profile, ensure proper drying, optimize stencil printing parameters.
Bridging/Shorts	Too much paste deposition, paste slump, misalignment, insufficient cooling.	Reduce aperture size, optimize print pressure, ensure proper alignment, increase cooling rate.
Insufficient Wetting	Contaminated pads, incorrect reflow profile (too low peak temp or insufficient time above liquidus).	Ensure clean PCBs, adjust reflow profile to achieve proper peak temperature and time.
Voiding	Excessive flux, trapped volatiles, improper reflow profile.	Optimize reflow profile, especially preheat and soak zones, to allow proper volatile escape.

## 8. SPECIFICATIONS

Attribute	Value
Product Name	WS-809 Water-Soluble Solder Paste
Alloy	Sn63Pb37
Model Number	89.8-3-M18

Attribute	Value
Weight	500g (Jar) / 1 Pound (as per product data)
Manufacturer	HISCO (as per product data)
First Available Date	June 23, 2022
ASIN	B072XSMZ1M

## 9. WARRANTY AND SUPPORT

Alpha products are manufactured to high-quality standards. For specific warranty information, please refer to the official Alpha website or contact your authorized distributor.

For technical support, product inquiries, or to report issues, please contact Alpha customer service or your local representative. Always provide the product model number (89.8-3-M18) and lot number (found on the product packaging) when seeking support.