

WS159 - Water Soluble Paste

Product Description

WS159 water washable solder paste is designed to meet the requirements for reliable solder joints in PCB assemblies. WS159 displays previously unseen levels of repeatability and consistency even in a wide range of temperatures (65°-85°F) and relative humidity (25 - 65% RH). Residues can be cleaned using warm water.

Attributes

- Enhanced activity for tough to solder boards and components
- Excellent volume transfer efficiency
- Resistance to slump and drying, even in extreme humidity conditions
- High speed stencil printing up to 150mm/sec
- Excellent low voiding performance that exceeds IPC Class III requirement
- Enhanced tack performance and printer open time
- Very cleanable post solder residues

Printing

WS159 solder paste is currently available for stencil printing down to 16 mil (0.4mm) pitch devices with type 3 powder (-325/+500 mesh). Printing at up to 100mm/sec can be reliably achieved in production using a metal squeegee blade. This is due to a unique rheology, which ensures that the higher shear rate viscosity is relatively low and the thixotropic index is high enough to ensure excellent definition and slump resistance, while maintaining good roll and drop off behavior. High squeegee pressures are not required, making WS159 particularly useful for second side printing processes.

| Printing Parameter | Value |
|---|--|
| Viscosity (measured at 25°C using Brookfield) | 700-800 kcps |
| Print Speed | 20-100 mm/sec |
| Squeegee Blade | 80-90 durometer or stainless steel |
| Stencil Material | Stainless steel, nickel, slic , ultra-slic |
| Temperature/Humidity | 70°-77°F & 45%-60%RH |

Performance

The performance of solder paste depends in part on the metal content, solder alloy and the solder particle size range. Increasing metal content reduces the tendency to slump and reduces the tack life of the solder paste, while the solder balling performance improves.

| Performance Parameters | Value |
|--|---------------------------------|
| Stencil Life (25°C @ 45% RH) | 8 Hours |
| Tack Life | +24 Hours |
| Tack Force | 1.8 grams/mm ² |
| Slump (25°C 1 Hour) | |
| 0.7mm pads | 0.4mm |
| 1.5mm pads | 0.4mm |
| Slump (80°C 20 Minutes) | |
| 0.7mm pads | 0.4mm |
| 0.7mm pads | 0.4mm |
| Note: Slump is expressed as the minimum spacing between pads that does not allow bridging. | |
| Abandon Time | |
| 20 mil aperture and greater | >2 hours |
| 16 mil to 10 mil aperture | 2 hours |
| 8 mil aperture or less | 1 hour |
| Flux activity (per ANSI/J-STD-004) | ORH0 |
| Typical SIR, IPC @ 96 hours (per IPC-J-STD-004) after cleaning | PASS 6.0 x 10 ⁸ ohms |
| Typical SIR, IPC @ 168 hours (per IPC-J-STD-004) after cleaning | PASS 1.5 x 10 ⁸ ohms |

Refrigeration and Storage

It is recommended to store WS159 at 0°-8°C. The paste should be removed from cold storage a minimum of 8 hours in the unopened container prior to use. If the paste does not reach room temperature, it may stick to the stencil, not deposit onto the SMT pads, de-wet pads or outgas during reflow, or produce solder balls. Avoid direct sunlight.

Handling and Shelf Life

The optimum temperature and humidity are 75°F and 45%RH and below, respectively. Provided WS159 solder paste is stored tightly sealed in the original container at 0°-8°C, a minimum shelf life of 6 months can be expected. Paste can be stored at room temperature up to 2 weeks prior to use. Air shipment is recommended to minimize the time that containers are exposed to higher temperatures.

Reflow

Heating Stage:

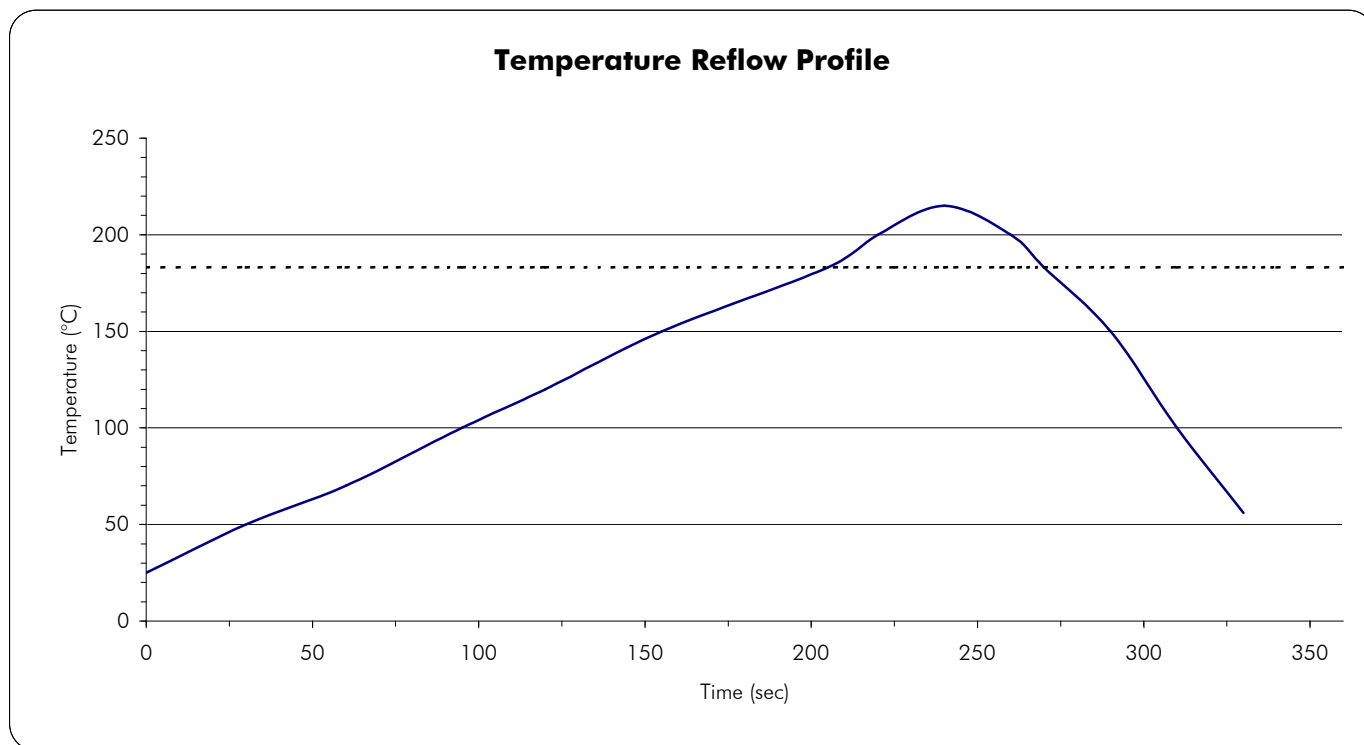
A straight ramp of 0.5°-1.5°C/sec permits gradual evaporation of volatile flux components and prevents solder balling and bridging.

Liquidus Stage:

Peak temperature should be 25°-45°C above the melting point of the alloy for no longer than 45-90 seconds. This will produce acceptable wetting and a solid solder joint to form. If the temperature or TAL is exceeded, excessive intermetallic formation, charred flux and board and/or component damage may occur.

Cooling Stage:

A rapid cool down of <math><4^{\circ}\text{C}/\text{sec}</math> is recommended to produce a fine grain structure. Cooling too slowly can produce a large grain structure, usually leading to poor fatigue resistance. Cooling too quickly can lead to stressed solder joints and components due to high CTE mismatch.



Cleaning

The post reflow residue of WS159 solder pastes must be removed. It is suggested that the residues are removed as soon after reflow as possible. However, effective cleaning can be accomplished up to 3 days after reflow, allowing time for secondary processing.

Health & Safety

This product, during handling or use, may be hazardous to health or the environment. Read the Material Safety Data Sheet and warning label prior to using this product.

Packaging

WS159 Solder Paste is available in:

- 250 or 500 gram plastic jar
- 500 gram or 1 kg cartridge for direct application
- 30 or 100 gram syringe for dispensable application

The information given in this technical data sheet is to the best of our knowledge, accurate. It is intended to be helpful, but no warranty is expressed or implied regarding the accuracy of such data. It is the user's responsibility to determine the suitability of their own use of the product described herein. Since conditions of the use are beyond our control, we disclaim all liability with respect to the use of any material supplied by us. Nothing contained herein shall be construed as permission or as recommendations to practice any patented invention without a license from the patent owner nor as recommended to use any product or to practice any patented invention without license from the patent owner nor as recommendation to use any product or to practice any process in violation of any law or government regulations.