

# Technical Bulletin

## WS150 Water Soluble Solder Paste

### Product Description

WS150 Water Washable Solder Paste is designed to meet the requirements for reliable solder joints in PCB board assemblies. It displays previously unseen level of repeatability and consistency. WS150 is halide-free, has a neutral pH and extended tack and stencil life. Residues can be cleaned using warm water with reduced foaming characteristics.

#### Attributes

- Enhanced activity for tough to solder boards and components
- Excellent slump resistance
- High speed stencil printing up to 150mm/sec
- Excellent tack performance and printer open time
- Extended “between-print” abandon time
- Very cleanable post solder residues

### 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.

<b>Printing Parameter</b>	<b>Value</b>
Viscosity (measured at 25C using Brookfield)	680- 780kcps
Print Speed	20-100 mm/sec.
Squeegee Blade	80 to 90 durometer or stainless steel
Stencil Material	Stainless Steel, Molybdenum, Brass, Nickel Plated
Temperature/ Humidity	Optimal ranges are 70-77F and 35-

<b>Performance Parameters</b>	<b>Value</b>
Stencil Life (25C @ 45% RH)	+24 Hours
Tack Life	+48 Hours
Tack Force	1.8 grams/mm <sup>2</sup>
Slump	
Room Temp., 1 hour	
0.7mm pads	0.4mm
1.5mm pads	0.4mm
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	
Pitch	
20 mil and greater	>2 hours
16 mil and less (10 mil aperture)	2 hour
(8 mil or less aperture)	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 <sup>8</sup> ohms
Typical SIR, IPC @168 hours (per IPC-J-STD-004) after cleaning	PASS 1.5 X 10 <sup>8</sup> ohms

**Refrigeration and storage:** It is recommended to store WS150 at 5-10<sup>0</sup>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 during reflow, outgas during reflow, or produce solder balls. Avoid direct sunlight.

**Handling and shelf life:** The optimum temperature and humidity are 75<sup>0</sup>F and 60% or below respectively. Provided WS150 solder paste is stored tightly sealed in the original container at 5-10<sup>0</sup>C, a minimum shelf life of 6 months can be

expected. Air shipment is recommended to minimize the time that containers are exposed to higher temperatures.

**Printing:** WS150 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 100 mm/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 rolls and drops off behavior. High squeegee pressures are not required, making WS150 particularly useful for second side printing processes.

**Reflow:** Reflow should be performed with a peak of 20-40°C above the liquid temperature of the alloy (depending on the type of board). This temperature should be maintained for 30-60 seconds. Profiles should have less than a 3-minute preheat time above 260°F(130°C) to insure proper wetting of fine pitch leads. A representative profile is shown below:

**Cleaning:** The post reflow residue of WS150 solder pastes must be removed. It is suggested that the residues are removed as soon after reflow as possible, although effective cleaning can be effected up to 3 days after reflow allowing time for secondary processing.

Cleaning can be achieved using moderate temperatures 25-70°C in most conventional aqueous cleaners. Cleaning takes typically 2-5 minutes.

Problems may also occur when the same cleaner is used for both solder paste and liquid flux. FCT Assembly 150N, VOC551, and WS100A liquid fluxes have proved to be compatible, as has the WS101 cored wire.

**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 before using this product.

**Packaging:**

WS150 Solder paste is available in:

- 500gram or 250 gram plastic jar.
- 1Kilogram, 500 gram or 250 gram cartridge for direct application.
- DEK ProFlow cassettes available upon request.

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