

# MetaPaste™ WS-400 SC995e™ Lead Free Water Soluble Paste Product Bulletin

## An Excellent Water Soluble Paste

Metallic Resources' MetaPaste WS-400 Lead Free is a general purpose mildly activated water soluble paste manufactured as a homogeneous mixture of special low oxide content lead free Sn99.5/Cu0.5/Co spherical solder powder, liquid flux, and gelling agents. The standard paste has a metal load of 89%, a particle size of 25-45 microns (-325 to +500 mesh), and a viscosity of 800-1,050 kcps. Other metal loads, particle sizes, and viscosities are available upon special request. It is **RoHS compliant**. It is available in 10cc (40 gram) syringes, 250 and 500 gram jars, and 500, 700, or 1,000 gram cartridges.

## Perfect for SMT Applications

MetaPaste WS-400 Water Soluble solder paste is specially designed for SMT, hybrid, and dispensing soldering applications. The viscosity provides a stiff, slump-resistant paste for stenciling.

## A Superior Water Soluble Paste

MetaPaste WS-400 Water Soluble solder paste provides a 12-14 hour stencil life, 16 hour tack time, excellent re-flow, superior slump resistance, and high tolerance to humidity. Superior activity and wetting characteristics have been engineered into the product. The 45 micron particle size is ideally suited for printing to a 12 mil pitch. It passes the halide test on silver chromate paper and copper mirror.

## Standards Met

Meets J-STD-004 requirements.  
Flux classification ORH1  
Copper Mirror: No removal of copper film  
Silver Chromate: Pass  
Corrosion: Pass  
SIR (J-STD-004):  $2.38 \times 10^{10}$  ohms  
(Bellcore/Telecordia):  $6.12 \times 10^{10}$  ohms

## Application Directions

MetaPaste WS-400 Water Soluble solder paste has a shelf life of up to 3 months if kept refrigerated. Opened jars should not be refrigerated again. Adequate time (8 hours) for the unopened refrigerated paste to equalize with ambient temperature must be allowed to prevent moisture condensation in the jar, which is detrimental to successful use of product. If moisture does infiltrate the paste, the viscosity may increase, the paste may dry out prematurely, and/or components may "pop" off the board.

The ideal temperature range for operation is between 68-74°F, with a relative humidity of 35-55%. Mix the product lightly and thoroughly for several minutes prior to application. Do not store new and used paste in the same container. Opened containers should be resealed when not in use.

Apply sufficient paste to the stencil to create a smooth, even roll during the print cycle. A bead diameter of 1/2" to 5/8" is sufficient. Apply small amounts of fresh MetaPaste WS-400 to the stencil frequently, at controlled intervals, to maintain the paste chemistry and application properties. Cleaning of the stencil will vary depending upon the application.

If desired, the paste may be cleaned in either an in-line or batch cleaning system. A water temperature of 55°C/130°F to 70°C/158°F is recommended.

## Safety Precautions

MetaPaste WS-400 Water Soluble solder paste should be used in a well ventilated area. If ventilation is inadequate, wear NIOSH approved respirator or equivalent. Wear suitable protective clothing, safety glasses, disposable vinyl gloves to avoid contact with skin and eyes. Refer to the Material Safety Data Sheet (MSDS) for additional information. Do not dispose of any lead-containing products in non-approved containers.



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## RECOMMENDED PROCESSING GUIDELINES

### Printing

Tack Time is sixteen (16) hours between printing, placement and reflow under ambient conditions below 23°C/74°F and a relative humidity below 60%. The exact time will depend on the environmental condition of the solder paste and plant. The ideal temperature range for operation of the solder paste is 20°C/68°F – 23°C/74°F, with a relative humidity of 35-55%. The viscosity of this solder paste is 800 to 1,050 kcps on the Brookfield viscometer.

Should printed circuit boards need to be stored for more than 6 hours after populating, prior to reflow, it is recommended that PCBs are maintained in a tightly controlled area. Humidity should be controlled between 35% - 55% and temperature should not exceed 23°C/74°F.

### Recommended Reflow Parameters

#### Sn99.5/Cu0.5/Co in Water Soluble and No Clean Formulations

**Preheat Zone:** Ramp to 150°C in 100 seconds to dry the volatiles from the solder paste.

**Soak Zone:** Soak 80 seconds @ 150-190°C to get uniform temperature equilibrium of PCB.

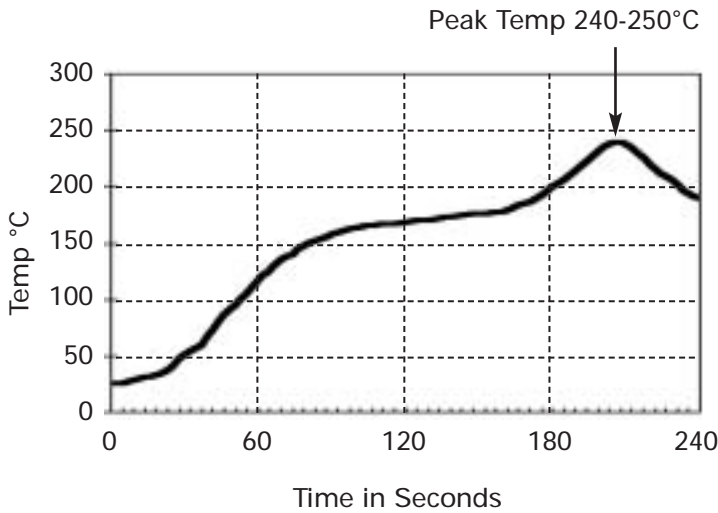
**Reflow Zone:** Ramp to a temperature of 240°C to 250°C for a period of 40 seconds for the Ramp/Soak/Spike profile.

Ramp to a temperature of 235°C to 245°C for a period of 40 seconds for the Optimized Ramp/Spike profile.

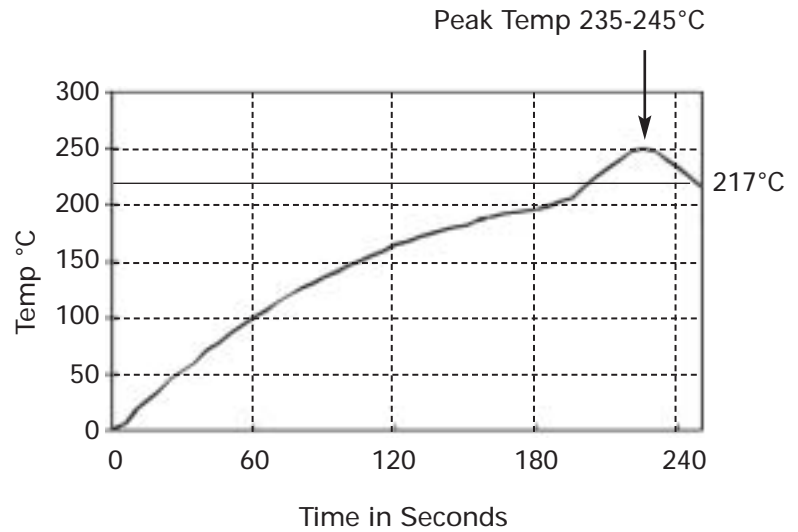
**Cooling Zone:** A cool down rate of 2°C, or more, per second is recommended for optimum results.

**Cleaning Lag Time:** Cleaning efficiency is not affected by lag time between reflow soldering and the cleaning process.

Ramp/Soak/Spike Reflow Profile



Optimized Ramp/Spike Profile



Squeegee Speed (in/sec)	90 D squeegee Pressure (lb/in)	Metal Blade Pressure (lb/in)
1	1.6 – 1.8	1.6 – 1.8
2	2.4 – 2.6	2.1 – 2.2
3	3.4 – 3.6	2.4 – 2.6
4	4.8 – 5.1	2.8 – 3.1

WS-400-0707

Recommendations made by this company and its representatives are based upon test data, experiments, and experience believed to be reliable. No guarantee of accuracy is made, however. All products are sold upon the condition that the buyer will make his own tests and assume the responsibility for the suitability of the product under his application and service conditions. Statements made herein will vary according to the nature of the surfaces to which the product is applied, application technique, and service condition. We in no event assume liability beyond the purchase price of our products involved and make as a condition of sale that we will refund the purchase price or replace materials proven to be defective and reported in a timely fashion, but no later than six (6) months after shipment. No representative of the manufacturer and/or seller has the authority to alter or extend these conditions.