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MacDermid Alpha ELECTRONICS SOLUTIONS

TECHNICAL DATA SHEET

ALPHA® WS-809 SOLDER PASTE

DESCRIPTION

ALPHA WS-809 is a SnPb, water-soluble solder paste which is designed for a broad range of SMT processes where aqueous post reflow cleaning is required.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Excellent volume transfer efficiency over broad range of environmental conditions
- Fine-pitch printing with consistent shape and volume to 16 mil pitch QFP (63x10x5 mil deposits) and 15 mil circles (BGA225)
- High throughput and yield with consistent print volumes at print speeds ranging from 1 – 6 inches/second
- Exhibits resistance to slumping and drying at temperature up to 66 to 84 °F (19 to 29 °C) and relative humidity extremes (35 to 65% RH)
- Water cleanable after two paste reflow cycles
- Excellent low voiding performance that exceeds IPC Class 3 requirement
- Superior solder spread performance on Cu OSP

PRODUCT INFORMATION

Alloys:	63Sn/37Pb, 62Sn/36Pb/2Ag, NT4S
Powder Size:	89.8% Metal, Type 3 (25 to 45 µm) / Type 4 (20 to 38 µm) per IPC J-STD-005)
Packaging Sizes:	500 gram jars, 6in and 12in cartridges
Flux Gel:	Available in 10cc and 30cc syringes for rework applications

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APPLICATION GUIDELINES

Print Capability

ALPHA WS-809 is formulated for both standard and fine feature pitch stencil printing, at print speeds between 1in/s (25 mm/s) and 6in/s (150 mm/s) with stencil thicknesses of 5 mil (0.125 mm) to 6 mil (0.15 mm), particularly when used in conjunction with ALPHA Stencils. Blade pressures should be between 1 to 2 lbs/in (0.16 to 0.34 kg/cm), depending on the print speed. The higher the print speed employed, the higher the blade pressure that is required.

TECHNICAL DATA

Category	Results	Procedures/Remarks
Chemical Properties		
Activity Level	ORH0 = J-STD Classification	IPC J-STD-004A
10 Day Copper Corrosion	**Pass,** (post-cleaning)	IPC J-STD-004A
Electrical Properties		
SIR (IPC) 1X Reflow	4.2 x 10^9 ohms	Pass, 7 days (>10^8 = Pass)
SIR (IPC) 2X Reflow with 48 hr delayed clean	1.1 x 10^9 ohms	Pass (>10^8 = Pass)
Electromigration (Bellcore)	Initial: 2.5 X 10^9 ohms; Final: 5.0 X 10^{10} ohms	Pass (Final > Initial/10)
Physical Properties		
Paste Density	4.4 g/cc typical	63Sn/37Pb alloy
Tack Force vs. Time and Humidity	**Pass**, Change of <1 g/mm^2 over 24 hours at 25% and 75% RH	IPC J-STD-005
Viscosity	1,550 to 2,550 poise	Malcom Spiral Viscometer; ICP-029 10 rpm
Solderball	Preferred	IPC J-STD-005
Stencil Life	8 hours	@ 30 to 50% RH, 75 to 80 °F (24 to 27 °C)
Slump	**Pass**	IPC J-STD-005 Pass, cold slump after 10 min RH and hot slump after 10 min at 150 °C at 25%, 50%, and 75% RH

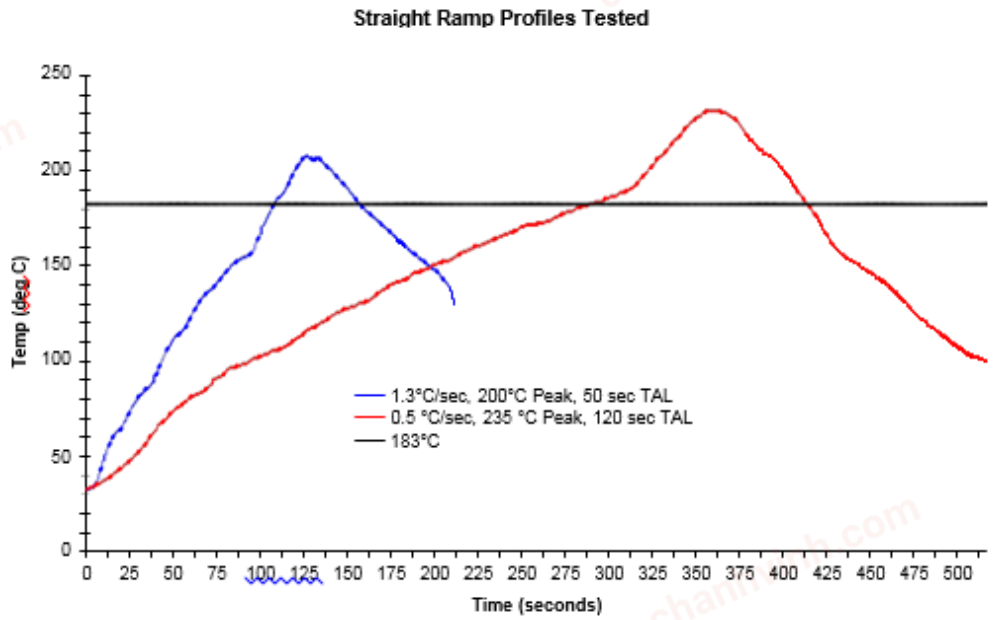
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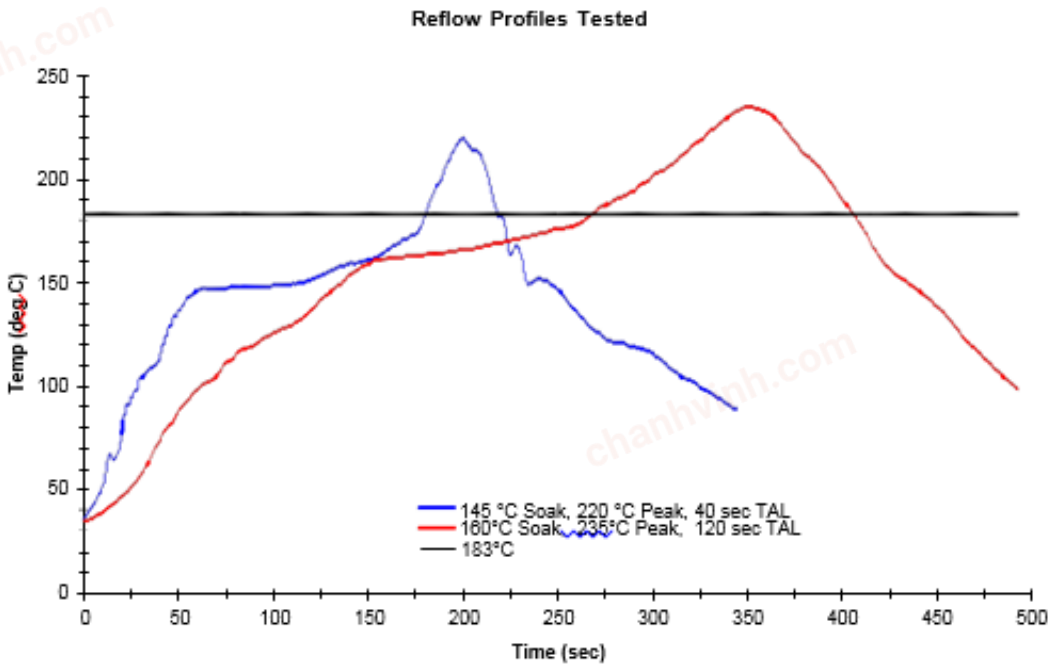
PROCESSING GUIDELINES

Storage-Handling	Printing	Reflow (See page 4)	Cleaning
• Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F) • Paste can be stored for 2 weeks at room temperature up to 77 °F (25 °C) prior to use. • When refrigerated, warm-up paste to room temperature for up to 4 hours. Paste must be ≥66 °F (19 °C) before processing. Verify paste temperature with a thermometer to ensure paste is at 66 °F (19 °C) or greater before setup. • Working range: 19 to 29 °C on the stencil. • Do not remove worked paste from stencil and mix with unused paste in jar. This will alter the rheology of the unused paste. • These are starting recommendations and all process settings should be reviewed independently. • 6 month refrigerated shelf-life	**Stencil:** Recommend ALPHA CUT or ALPHA FORM stencils at 0.125 to 0.150mm (5-6 mil) thick for 0.4 to 0.5mm (0.016" or 0.020") pitch. Stencil design is subject to many process variables. Contact your local ALPHA site for advice. **Aperture Design:** ALPHA WS-809 may be printed using various aperture designs. A 10% reduction is recommended to optimize wipe frequency when using a stencil > 5mils. **Squeegee:** Metal (recommended) **Paste Roll:** 0.4 to 0.6 inches (1 to 1.5 cm) diameter and make additions when roll reaches 0.2 inch (0.5cm) diameter. **Pressure:** 1.0 to 2.0 pounds per inch of squeegee length (0.16 to 0.34 kg/cm). **Speed:** 1 to 6 inches (25 to 150 mm) per second. Release speed: within 3 to 10 mm/s. Setting done under microscope. Poor release typically results in icicles or missing paste in small apertures.	Clean-dry air or nitrogen atmosphere. **Profile (63/37 alloy):** • Straight ramp of 0.5 to 1.3°C/sec to 200 to 235°C peak, TAL of 40 to 120 sec, time to peak < 4 minutes is recommended. • Soak profile of 1.5 to 2.0 °C/sec to 145 to 160° soak for a max of 90 seconds, peak temperature of 200 to 235 °C, TAL of 40 to 120 sec, time to peak < 4 minutes is recommended. • Cool down at -1 to -3 °C/second Start with straight ramp design if new oven settings are required. Internal testing has shown straight ramp profile to be most effective for superior joint cosmetics (shininess).	• ALPHA WS-809 can generate foam while being cleaned in recirculating systems. ALPHA 2007 is the recommended de-foamer. • The flux residues from Alpha WS-809 are water cleanable after two paste reflow cycles • Recommended rinse temperature 120 to 160 °F (49 to 70 °C) • No special nozzle configurations • Effective residue cleanability up to 48 hours after reflow. This allows maximum process flexibility and can eliminate an extra cleaning step in double- sided reflow processes • Ionic contamination levels passes **IPC J-STD 001D** requirement (< 10µg/in^2) Typical result is <3 µg/in^2 attained with heated solution tested with an Ionograph.

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REFLOW PROFILES





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TECHNICAL DATA SHEET

RECYCLING SERVICES

We provide safe and efficient recycling services to help companies meet their environmental and legislative requirements and at the same time, maximize the value of their waste streams.

Our service collects solder dross, solder scrap, and various forms of solder paste waste. Please contact your local sales representative for recycling capabilities in your area.



SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available.**

STORAGE

ALPHA WS-809 should be stored refrigerated upon receipt at 0 to 10 °C (32 to 50 °F). This will be sufficient to maintain a nominal shelf life. Paste should be permitted to reach room temperature before unsealing its package prior to use. Room temperature storage for sealed containers should not exceed 14 days. The shelf-life of refrigerated paste is 6 months.

CONTACT INFORMATION

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE . Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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