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MacDermid Alpha ELECTRONICS SOLUTIONS

TECHNICAL DATA SHEET

ALPHA® WS-619 Solder Paste

Water-Soluble; ORHO Per IPC-J-STD-004

DESCRIPTION

ALPHA WS-619 is completely water soluble, halide free solder paste. **ALPHA WS-619** is designed for stencil application in surface mounting processes where aqueous post reflow cleaning is required.

FEATURES & BENEFITS

- Shiny joints can be expected under a wide range of process conditions.
- Minimal foam is generated from cleaned flux residues in recirculating post-cleaning equipment.
- High Reflow Tolerance using a variety of reflow profiles & a wide temperature range.
- Excellent wetting characteristics on all types of copper protective coatings (including OSPs).
- Fast, accurate fine-pitch printing.

PRODUCT INFORMATION

Alloys:	63Sn/37Pb, 62Sn/36Pb/2Ag, SAC305
Powder Size:	Type 3, Type 4
Packaging Sizes:	500 gram jars, 6in & 12in cartridges, and 10cc & 30cc dispense syringes.
FluxGel:	ALPHA WS-619 Flux Gel is available in 10cc and 30cc syringes for rework applications.

APPLICATIONS GUIDELINES

Formulated for standard and fine pitch printing through stencil apertures as small as 0.008 inches (0.2 mm). Crisp, well defined print definitions are repeatably attainable on 0.016 inch (0.4mm) pitch pads.

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TECHNICAL DATA

Category	Results	Procedures/Remarks
Fluxing Ability	Reflowed Solder Paste, Hot Solder Dip, Tin Plate, Tin Hot Dip, Silver Plate, Copper, Gold, Ag/Pd Plate, Cu Protective Coatings	Fluxing ability on tarnished surfaces
Chemical Properties		
Flux Designation	ORH0 – Organic Flux, High Activity, 0% Halide by titration	IPC J-STD-004
Electrical Properties		
SIR (IPC)	Pass (>.10^8 ohms), cleaned	4 day, 7 day 85 °C/85% RH
SIR (Bellcore)	Pass (>10^{11} ohms), cleaned	4 days, 35 °C/85% RH
Electromigration (500 hour Bellcore)	Pass visual and electrical, cleaned	500 hrs, 85 °C/85% RH
Color	Clear, Colorless Flux Residue	
Tack Force	> 1.5 g/mm^2 @ 6 hours	J-STD-005, See figure #2
Stencil Life	> 4 hours	@ 50%RH, 72 °F
Slump	Suitable for fine pitch printing applications	IPC-TM-650

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PROCESSING GUIDELINES

The following is a review if general application notes and precautions.

Storage-Handling	Printing	Reflow (See Figure 1a and 1b)	Cleaning
• Refrigerate to guarantee stability @ 32 to 50 °F (0 to 10 °C) • Shelf life of refrigerated paste is three months. • Warm-up 500g jar to room temperature (should be ~ 4 hours). Set up printer with room temperature paste. Check paste temperature with a thermometer. • Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste.	**Stencil:** Recommend Alpha laser cut stencil @ 0.006 inch thick for 0.020 mil pitch (.008 inch thick for 0.025 inch pitch) or Alpha manufactured chemically etched stencil. **Squeegee:** Recommend metal or 90 durometer polyurethane. **Pressure**: 1 to 2.0 pounds per linear inch of print pattern. **Speed:** 0.5 to 4.0 inch (15 to 150mm) per second **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.	- Use convection, IR, or combination ovens, hot -plate, vapor phase. - Clean-dry air or nitrogen atmosphere. **PROFILE (63/37 Alloy):** The following profile is provided as an initial guide to reflow of ALPHA WS-619. Changes may be required on differences in thermal inertia and component sensitivity. - Ramp @ 60 to 120 °C /min. to 125 to 160 °C. - Dwell @ 125 to 160 °C for 0.5 to 2.0 minutes. - Ramp @ 60 to 120 °C /min to 210 to 225 °C peak temp. - Time over 183 °C = 45 to 75 sec - Ramp down to R.T. @ 90 to 120 °C/min. - Ensure solder is frozen at exit of last heated zone to avoid disturbed joint defects. **SAC305 Profile** - Ramp @ 1.0 to 2.0 °C /sec. to 130 °C. - Slow ramp from 130 °C for 90 to 120 seconds - Ramp @ 0.5 to 2 °C/sec to peak temperature 230 to 250 °C TAL for 40 to 80 seconds. - Ramp down to R.T @ 1 to 3 °C/sec.	ALPHA WS-619 is designed to be water rinsed in washing operations with minimal foaming in recirculating systems. The flux residues from ALPHA WS-619 are completely water soluble. Suggestions for optimized cleaning: Wash within 24 hours of reflow. 2 hours for best performance. Use deionized water 120 to 140° F wash and rinse temperatures. Allow assemblies to first cool to below wash temperature. Low pressure/high water volume washing. High volume/low temperature drying. Perform regular filter maintenance in recirculating systems.

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REFLOW PROFILES

Figure 1a: SAC305 Reflow Profile

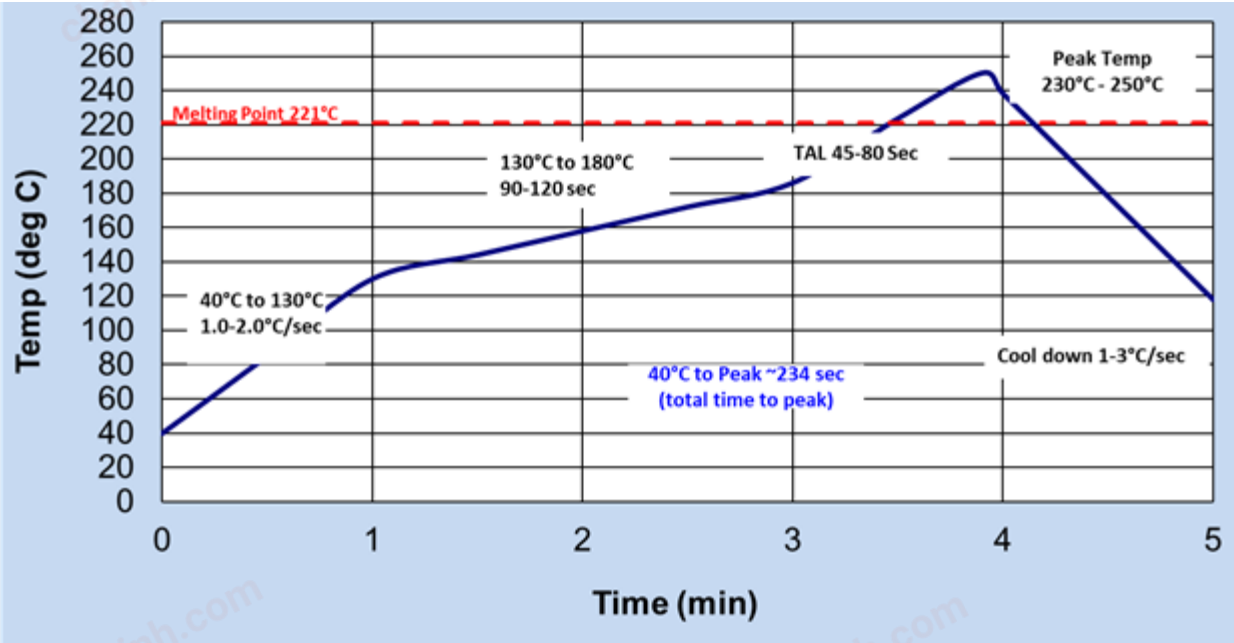
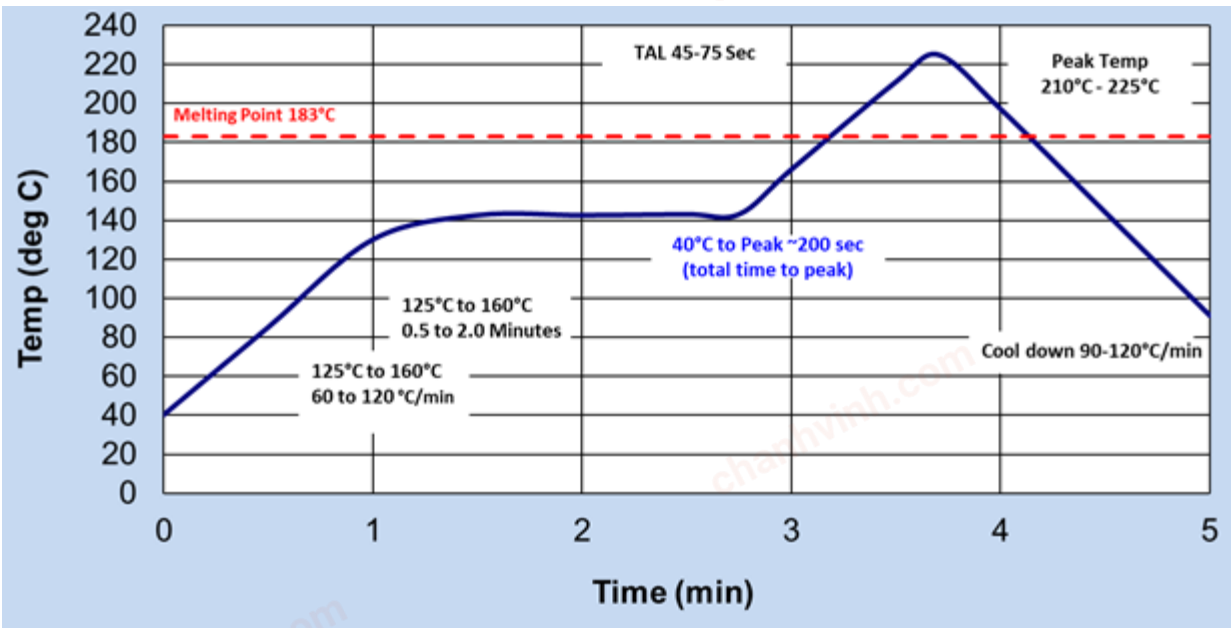
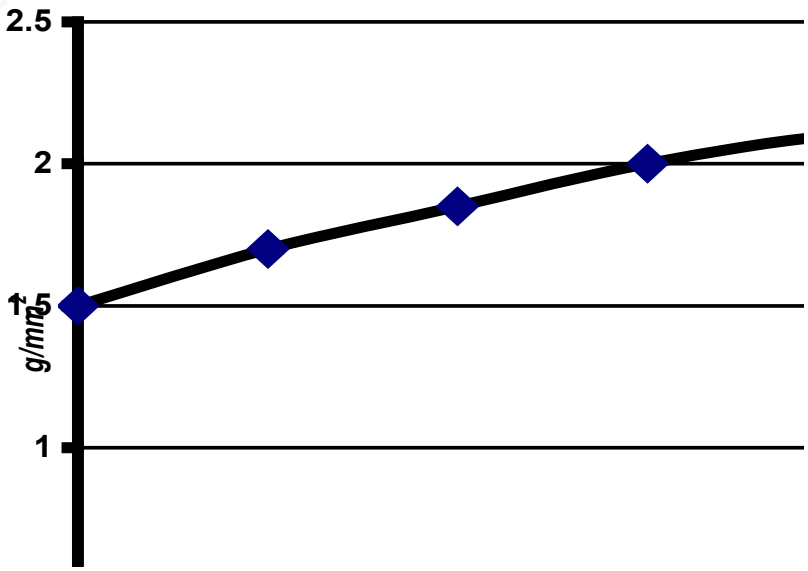


Figure 1b: Tin/Lead Reflow Profile



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Figure 2: Tack vs. Time



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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.



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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-619 is shipped in thermally controlled boxes and should be stored refrigerated upon receipt at 32 to 50 °F (0 to 10 °C). This will be sufficient to maintain a nominal shelf life of 3 months. ALPHA WS-619 should be permitted to reach room temperature before unsealing its package prior to use.

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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