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MacDermid Alpha ELECTRONICS SOLUTIONS

TECHNICAL DATA SHEET

ALPHA® OM-5300

Tin-Lead Paste for Mixed Alloy Assemblies

DESCRIPTION

ALPHA OM-5300 no-clean solder paste was developed to meet the demands of tin-lead soldering when lead-free components are present in the circuit assembly. Like all Alpha solder pastes, **ALPHA OM-5300** has excellent print volume repeatability to minimize variation in the print process. **ALPHA OM-5300** minimizes print cycle times through high print speeds and extended number of prints between stencil under cleaning.

ALPHA OM-5300 is different due to its ability to withstand long, hot soak reflow profiles, allowing better wetting of lead-free surfaces with tin lead paste alloy. Very low BGA voiding, in conjunction with very high post reflow SIR readings makes **ALPHA OM-5300** ideal for tin-lead soldering when lead free components are used.

ALPHA OM-5300 is also a zero-halogen product with no halogens intentionally added to the formulation.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

- Print Consistency: Lower “deposit to deposit” variation drives maximization of first pass print and reflow yields
- Fine Feature Capability: High print deposit volumes and low volume variability down to 12 mil (0.30mm) circle feature sizes.
- Low BGA Voiding: Class 3 voiding resistance even when SAC 305 BGA spheres are used.
- Electrical Reliability: Exceeds the requirements of the IPC and Bellcore SIR electrical reliability tests.
- Suitable for fine pitch applications such as 0.5 mm (20mil) pitch Flip-Chip and 0201 assembly.
- Excellent response to pause performance, generating fewer defects due to start up.
- High print speed, up to 150 mm/sec (6 inch/sec).
- Efficient activation system providing defect-free soldering with a wide range of oven profiles.
- High yield for in circuit testing (low level of false negatives).

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PRODUCT INFORMATION

Alloy:	63Sn/37Pb, 62Sn/36Pb/2Ag, and 62.8Sn/36.8Pb/0.4Ag (NT4S, Anti Tombstoning Alloy)
Powder Size:	Type 3 (25 to 45µm per IPC J-STD-005) Type 4 (20 to 38µm per IPC J-STD-005)
Packaging:	500 gram jars and 6" and 12" cartridges, ProFlow® Cassettes.

APPLICATION GUIDELINES

Formulated for both standard and fine pitch SMT stencil printing with apertures down to 0.3mm (12 mil) diameter and print speeds up to 150mm/sec (6"/sec) with standard stencil thickness of 0.1mm (4 mil) to 0.15mm (6 mil), particularly when used in conjunction with Alpha Stencils.

TECHNICAL DATA

Category	Results	Procedure/Remarks
Chemical Properties		
Activity Level	ROL0 = J-STD Classification Corrosivity - Cu Mirror Pass (L)	IPC J-STD-004
Halide Content	Halide free (by titration) Passes Ag Chromate Test	IPC J-STD-004
Electrical Properties		
SIR (IPC 7 days @ 85 °C/85% RH)	7.7 x 10^8 ohms	Pass, IPC J-STD-004 Pass = 1 x 10^8 ohm min, uncleaned
SIR (Bellcore 96 hrs @35 °C /85% RH)	1.3 x 10^{11} ohms	Pass, Bellcore GR78-CORE Pass = 1 x 10^{11} ohm min
Electromigration Resistance	Meets/Exceeds JIS, Bellcore and HP EL-EN 861-00 Requirements	
Physical Properties		
Flux Residue Cosmetics	Clear, Colorless Flux Residue	63Sn/37Pb alloy
Tack Force vs. Humidity (6 hrs)	Less than 1g/mm^2 change at 25%,50% and 75% RH	IPC J-STD-005
Viscosity	90-3-M17, designated M17 is suitable for all typical stencil-printing applications. Target	Malcom Spiral Viscometer; J-STD-005

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Category	Results	Procedure/Remarks
	Viscosity of 1700 poise at 10 RPM Malcom	
Solderball	Pass < 10 count (63Sn/37Pb alloy)	Pass IPC J-STD-005
Stencil Life	> 8 hours	@ 50%RH, 74°F (23°C)
Slump	Hot Slump & Cold Slump Pass	IPC J-STD-005
	Pass	DIN Standard 32 513, 5.3

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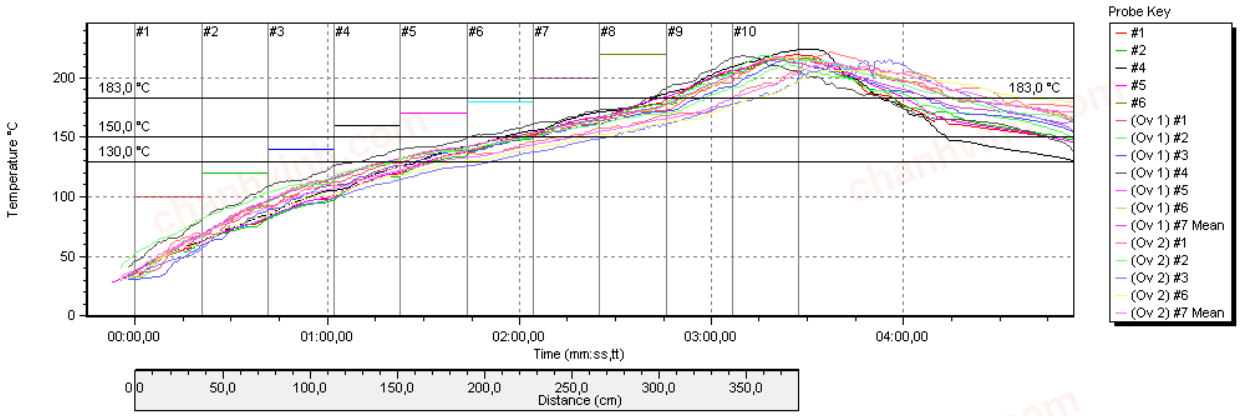
PROCESSING GUIDELINES

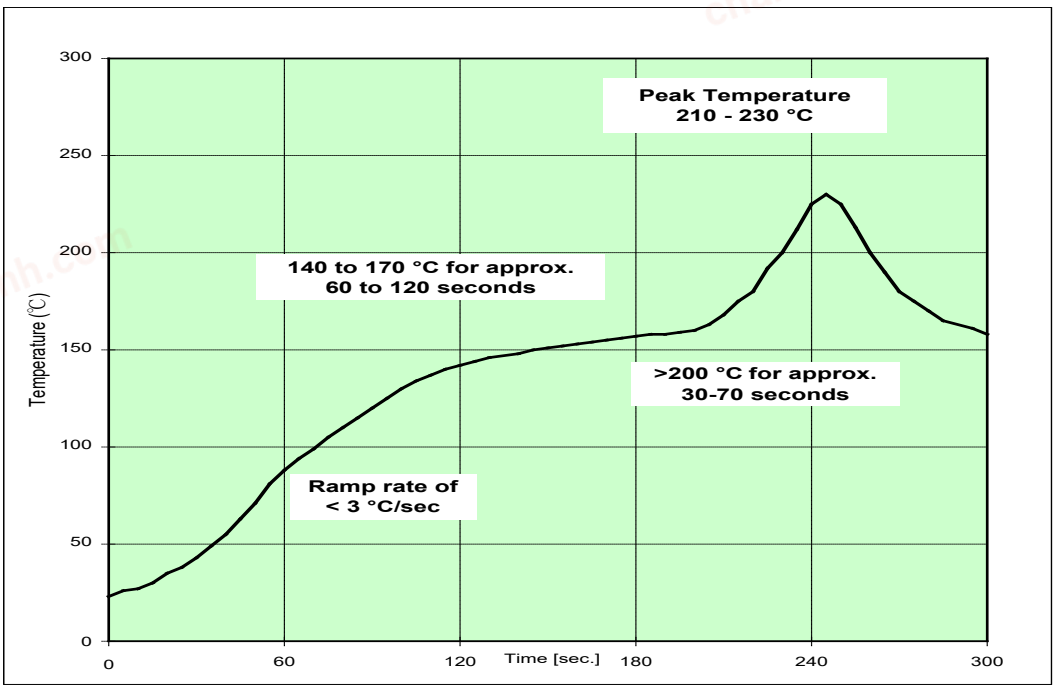
Storage & Handling	Printing	Reflow	Cleaning
• Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F). • Shelf life of refrigerated paste is six months. • Paste can be stored for 2 weeks at room temperature up to 25 °C (77 °F) prior to use. • Required warm-up of paste container to room temperature for up to 8 hours. Paste must be room temperature before processing. • Verify paste temperature is above 19 °C (66 °F) with a thermometer. Printing can be performed at temperatures up to 28 °C (82 °F). • Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste. • Working conditions: 19 °C to 32 °C	**Stencil:** Recommend ALPHA CUT or ALPHA FORM stencils @ 0.1 mm (4 mil) to 0.15 mm (6 mil) thick **Squeegee:** Metal. **Paste Roll:** 1.5 to 2.0 cm diameter and make additions when roll reaches 1 cm diameter. Maximum roll size will depend upon blade. **Pressure:** 0.15 to 0.3 kg per cm (0.8 to 1.5 pounds per linear inch) of squeegee length. **Print Speed:** 1 to 6 inches (25 to 150 mm) per second. **Release Speed:** within 3 to 10 mm/s. To define under microscope. Bad setting will give icicle or solder paste missing in small apertures. **Print Pump Head:** ALPHA OM-5300 is suitable for use in both MPM® RheoPump and DEK® ProFlow® systems.	**Atmosphere:** Clean-dry air or nitrogen atmosphere. **Profile window (SnPb alloys):** From 40 to 183 °C: 2mn 30 secs to 3mn 30 secs From 150 to 183 °C: 45 to 90 secs From 130 to 183 °C: 1mn to 2 mn Time above 183 °C = 30 to 90 secs Peak temperatures: **200 to 235 °C**. The upper end of the peak temperature range may be required to collapse lead free BGA components…etc.	ALPHA OM-5300 residue is designed to remain on the board after reflow. Reflowed flux residue can be removed with ALPHA BC 2200 Aqueous cleaner, ALPHA SM-110E or Kyzen Micronox MX2501. 5 minute agitation is required for the 2 solvent based cleaners. For misprints and stencil cleaning, ALPHA SM 110E, SM-440, Bioact BC-2200 may be used.

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REFLOW PROFILES

Figure 1 and 2: Typical SnPb Alloy Reflow Profiles





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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.



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 OM-5300 should be stored in a refrigerator upon receipt at 35 to 45 °F (1 to 10 °C). Permit paste to reach room temperature prior to opening, as this will prevent condensation of moisture on the solder paste. Other storage conditions are provided on page 4.

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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