

ALPHA® OM338-T

Ultra-Fine Feature, Lead-Free Solder Paste

DESCRIPTION

ALPHA OM-338-T is a lead-free, no-clean solder paste designed for a broad range of applications. **ALPHA OM-338-T's** broad processing window is designed to minimize transition concerns from tin/lead to lead free solder paste. This material is engineered to deliver the comparable performance to a tin lead process.* **ALPHA OM-338-T** yields excellent print capability performance across various board designs and, particularly, with ultra fine feature repeatability (11 mil Squares) and high throughput applications.

Outstanding reflow process window delivers good soldering on CuOSP with excellent coalescence on a broad range of deposit sizes, excellent random solder ball resistance and mid-chip solder ball performance. **ALPHA OM-338-T** is formulated to deliver exceptional visual joint cosmetics. Additionally, **ALPHA OM-338-T's** capability of IPC Class III for voiding and ROL0 IPC classifications ensures maximum long-term product reliability

**Although the appearance of these lead-free alloys will be different to that of tin-lead, the mechanical reliability is equal to or greater than with that of tin-lead or tin-lead-silver.*

FEATURES & BENEFITS

- Maximizes reflow yield for lead-free processing, allowing full alloy coalescence at circular dimensions as small as 0.25mm (0.010") with 0.100mm (4mil) stencil thickness.
- Excellent print consistency with high process capability index across all board designs.
- Print speeds of up to 200mm/sec (8"/sec), enabling a fast print cycle time and a high throughput.
- Wide reflow profile window with good solderability on various board / component finishes.
- Excellent solder and flux cosmetics after reflow soldering
- Reduction in random solderballing levels, minimizing rework and increasing first time yield
- Meets highest IPC 7095 voiding performance classification of Class III.
- Excellent reliability properties, halide-free material
- Compatible with either nitrogen or air reflow

SAFETY

While the **ALPHA OM-338-T** flux system is not considered toxic, its use in typical reflow will generate a small amount of reaction and decomposition vapors. These vapors should be adequately exhausted from the work area. Consult the SDS for additional safety information. Consult the SDS for all safety information. The most recent version of the SDS is available from AlphaAssembly.com.

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PRODUCT INFORMATION

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|-------------------------|--|
| <u>Alloys:</u> | SAC305 (96.5%Sn/3.0%Ag/0.5%Cu) SAC387 (95.5%Sn/3.8%Ag/0.7%Cu) SAC396 (95.5%Sn/3.9%Ag/0.6%Cu) SAC405 (95.5%Sn/4.0%Ag/0.5%Cu) SACX Plus™ 0307, SACX Plus™ 0807 |
| <u>Powder Size:</u> | Type 3, Type 4 |
| <u>Residues:</u> | Approximately 5% by (w/w) |
| <u>Packaging Sizes:</u> | 500 gram jars, 6" & 12" cartridges, and 10cc and 30cc dispense syringes. |
| <u>Flux Gel:</u> | OM-338 Flux Gel is available in 10cc and 30cc syringes for rework applications. |
| <u>Lead Free:</u> | Complies with RoHS Directive 2011/65/EU |

NOTE: For other alloys, powder size and packaging sizes, contact your local Alpha Sales Office.

TECHNICAL DATA

| CATEGORY | RESULTS | PROCEDURES/REMARKS |
|---|---|---|
| CHEMICAL PROPERTIES | | |
| Activity Level | ROLO | IPC J-STD-004A IPC J-STD-004B |
| Halide Content | Halide free (by titration) | IPC J-STD-004A IPC J-STD-004B |
| Halogen Test | Pass , Zero Halogen - No halogen intentionally added | EN14582, by oxygen bomb combustion, Non-detectable (ND) at < 50 ppm |
| Ag Chromate Test | Pass | IPC J-STD-004A |
| Copper Mirror Test | Pass | IPC J-STD-004A |
| Copper Corrosion Test | Pass (No evidence of Corrosion) | IPC J-STD-004A |
| ELECTRICAL PROPERTIES | | |
| SIR (IPC 7 days @ 85° C/85% RH) | Pass | IPC J-STD-004A |
| SIR (IPC 7 days @ 40°C/90% RH) | Pass | IPC J-STD-004B |
| SIR (Bellcore 96 hrs @ 35°C/85%RH) | Pass | Bellcore GR78-CORE |
| Electromigration (Bellcore 96 hrs @ 65°C/85%RH 10V 500 hrs) | Pass | Bellcore GR78-CORE |

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| PHYSICAL PROPERTIES (Using 88.5% Metal, Type #3 Powder) | | |
|---|---|-------------------------------------|
| Color | Clear, Colorless Flux Residue | |
| Tack Force vs. Humidity (t=8 hours) | Pass , Change of <1 g/mm ² over 24 hours at 25% and 75 % Relative Humidity | IPC J-STD-005 |
| Tack Force vs. Time | Pass , Change of <1 g/mm ² over 24 hours at 25% and 75 % Relative Humidity | IPC J-STD-005 |
| | Pass , Change of <10% when stored at 25±2°C and 50±10% relative humidity | JIS Z-3284, Annex 9 |
| Viscosity | Printing: 88.5% metal load for Type 3 & Type 4 Powder with target viscosity of 1100 – 1300 poise; 89% metal load for T4 with target viscosity of 2200 poise Dispensing: 86% metal load Type 5 with target viscosity of 800 Poise | Malcom Spiral Viscometer; J-STD-005 |
| Solderball | Acceptable (SAC 305 and SAC405 alloys) | IPC J-STD-005 |
| | Pass , Class 2, 1 hour and 72 hour | DIN Standard 32 513, 4.4 |
| Spread | Pass | JIS-Z-3197: 1999 8.3.1.1 |
| Flux Tackiness Test | Pass | DIN 32513 Talc Test |
| Slump | Pass | IPC J-STD-005 (10 min, 150°C) |
| | Pass | DIN Standard 32 513, 5.3 |
| | Pass | JIS-Z-3284-1994 Annex 8 |
| Stencil Life | 8 hours | @ 50%RH, 23°C (74°F) |

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STORAGE & APPLICATION

| ALPHA OM-338-T PROCESSING GUIDELINES | | | |
|---|--|---|--|
| HANDLING | PRINTING | REFLOW | CLEANING |
| <ul style="list-style-type: none"> •Refrigerate to guarantee stability @ 0-10°C (32-50 °F) •Shelf life of refrigerated paste is six months from the manufacturing date. •Paste can be stored for 2 weeks at room temperatures up to 25°C (77°F) prior to use. •When refrigerated, warm-up of paste container to room temperature for up to 4 hours. Paste must be ≥19°C (66°F) before processing. Verify paste temperature with a thermometer to ensure paste is at 19°C (66°F) or greater before setup. Printing can be performed at temperatures up to 29°C (84°F). •Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste. | <p>STENCIL: Recommend ALPHA CUT or ALPHA FORM stencils @ 0.100mm - 0.150 mm (4-6 mil) thick for 0.4 - 0.5 mm (0.016" or 0.020") pitch. Stencil design is subject to many process variables. Contact your local Alpha stencil site for advice.</p> <p>SQUEEGEE: Metal (recommended)</p> <p>PRESSURE: 0.16-0.34 kg/cm of squeegee length (0.9-2.0 lbs./inch).</p> <p>SPEED: 25 to 200mm per second (1 to 8 inches per second).</p> <p>STENCIL RELEASE SPEED: 5-20mm/sec.</p> <p>PASTE ROLL: 1.5-2.0 cm diameter and make additions when roll reaches 1-cm (0.4") diameter (min). Max roll size will depend upon blade.</p> <p>PRINT PUMP HEAD: Passes MPM 2000 print compaction and DEK ProFlow™ testing.</p> | <p>ATMOSPHERE: Clean-dry air or nitrogen atmosphere.</p> <p>PROFILE (SAC Alloys): A straight ramp profile @ 0.8°C to 1.7°C per second ramp rate is recommended (TAL 35 - 90 sec and peak 232-250°C).⁽¹⁾ Higher density assemblies may require preheating within the profile and may be accomplished as follows:</p> <ul style="list-style-type: none"> - From 40°C to Liquidus: Between 2min 30 sec. and 4 min. (optimum⁽²⁾ is 3 min.) - From 170°C to Liquidus: Between 45 sec. and 75 sec. (optimum⁽²⁾ is 1 min.) - From 130°C to Liquidus: Between 1min. 20 sec. and 2 min. 15 sec. (optimum⁽²⁾ is 1min. 30 sec.) - Time above liquidus: Between 30 sec. and 90 sec. (optimum⁽²⁾ is 45 sec. to 70 sec.) <p>Note 2: Refer to component and board supplier data for thermal properties at elevated temperatures. Lower peak temperatures require longer TAL for improved joint cosmetics.</p> <p>Note 3: OM-338-T is designed to work under a wide range of reflow profiles in order to find the optimum profile for your process. This can be achieved by balancing:</p> <ol style="list-style-type: none"> (1) Minimum Delta T's (depending on board mass and thermal oven characteristics) (2) Maximum Reflow Yield (includes voiding, cosmetics, solder balling, etc.) (3) Minimum Stress and Overheat for Components and Boards (refer to suppliers' guidelines and specifications.) <p>Contact your local Alpha Customer Technical Service representative for further details.</p> | <p>ALPHA OM-338-T residue is designed to remain on the board after reflow. If reflowed residue cleaning is required, ALPHA BC-2200 aqueous cleaner is recommended. For solvent cleaning, agitation for 5 min in the following cleaners is recommended:</p> <ul style="list-style-type: none"> - ALPHA SM-110E - ATRON® AC 205 (Zestron) <p>Misprints and stencil cleaning may be done with ALPHA SM-110E, ALPHA SM-440, ALPHA BC-2200, and ZESTRON® SD 301 cleaners.</p> |

Note 4: The processing guidelines recommended and typical reflow profiles presented were tested in the lab with acceptable performance. Optimization to each board application should still be carried out by users to ensure best results.

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Figure 1: Typical Soak Reflow Profile for SAC Alloys

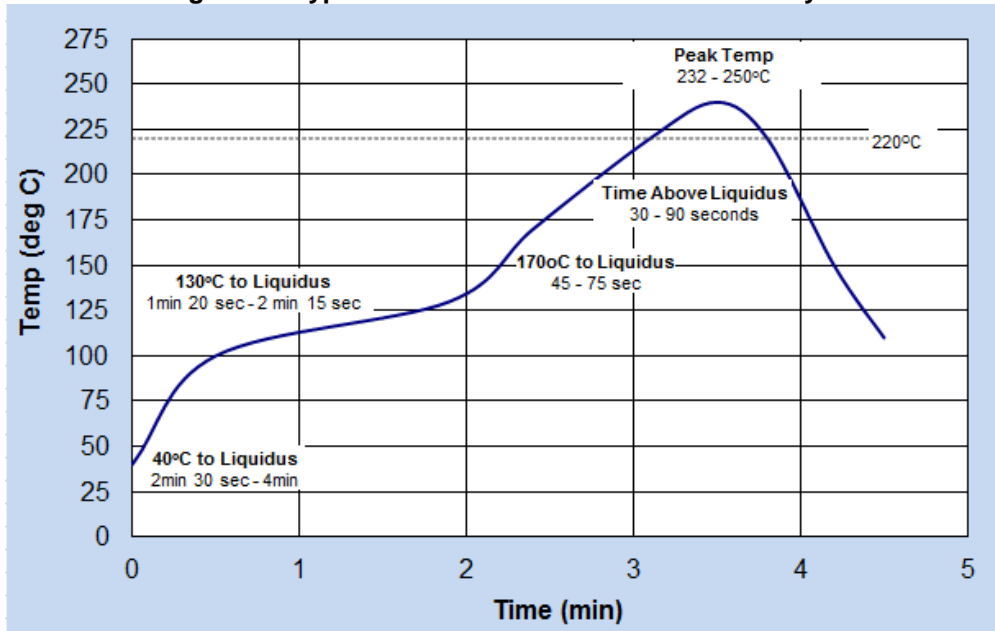
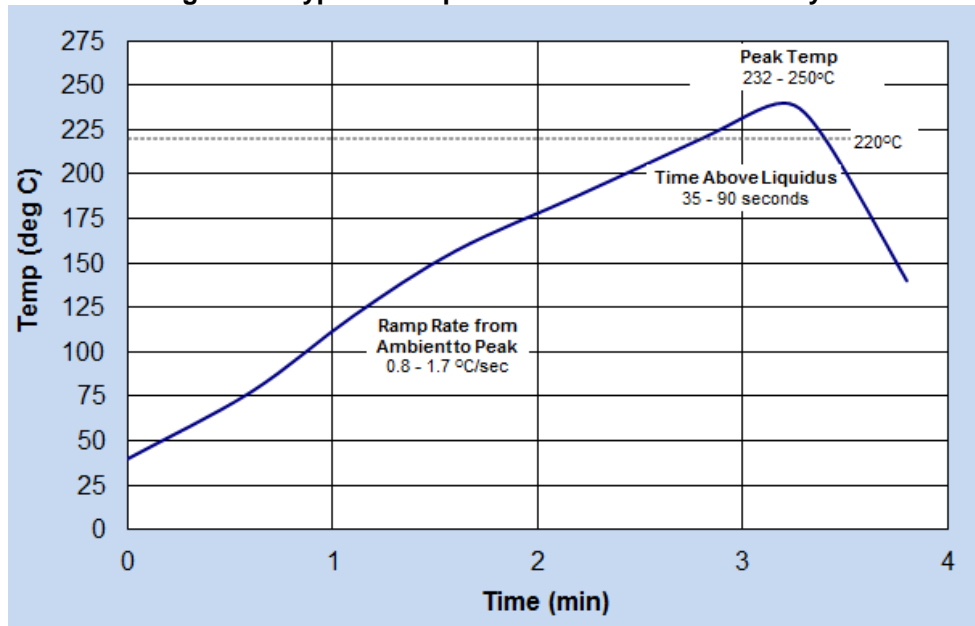


Figure 2: Typical Ramp Reflow Profile for SAC Alloys



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CONTACT INFORMATION

To confirm this is the most recent issue, please contact Alpha Assembly Solutions

AlphaAssembly.com

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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 directory assistance Chemtrec 1 - 800 - 424 - 9300.

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