

ALPHA[®] OM-325

Fine Feature, Lead-Free Solder Paste

DESCRIPTION

ALPHA OM-325 is a lead-free, no-clean solder paste designed for μ -Fine feature printing and reflow. **ALPHA OM-325's** has a wide processing window that provides a surface mount process solution for component metrics down to 0402mm (01005inch). **ALPHA OM-325** yields excellent print capability performance across various board designs and particularly with μ -Fine Feature repeatability of 0.16mm (6.5mil circles) across 8 hours of production.

Outstanding reflow process window, even with high soak profiles (60 to 90 seconds at 180 to 190 °C) in air and nitrogen atmosphere delivers good soldering on Cu OSP with excellent coalescence on broad range of deposits sizes, excellent random solder ball resistance, and mid-chip solder ball performance. **ALPHA OM-325's** cosmetic capabilities* deliver excellent visual inspection.

Additionally, **ALPHA OM-325's** capability of IPC Class III for voiding and ROL-0 IPC classifications ensures maximum long-term product reliability.

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

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Excellent print consistency with high process capability index across all board designs.
- Excellent stencil life with consistent performance over 8 hours of printing.
- Maximized reflow yield for Lead-Free processing, allowing full deposit coalescence at circular apertures as small as 0.16mm (0.0065") 1 in diameter.
- Wide reflow profile window allowing good solderability of complicated high-density PWB assemblies both in air and nitrogen reflow.
- Excellent solderability enabling the process to handle the most difficult wetting requirements such as Pd finish and other Lead Free PWB/components surface finishes.
- Excellent solder and flux cosmetics after reflow soldering even with a long/high thermal soaking.
- Reduction in random solder balling levels, minimizing rework and increasing first time yield.
- Meets highest IPC voiding performance classification of Class III under certain reflow conditions.

- Excellent component placement re-alignment during reflow, even with most demanding reflow setting.
- Excellent reliability properties, halide-free material graded ROL0 according to IPC classification.

PRODUCT INFORMATION

<u>Alloys:</u>	SAC305, SAC405, SACX0307, & 95Sn5Sb, e1 alloys per JESD97 Classification For other alloys, contact your local Alpha Sales Office
<u>Powder Size:</u>	Type 4 & Type 5
<u>Residues:</u>	Approximately 5% by (w/w)
<u>Packaging Sizes:</u>	500gm jars and 6" cartridges
<u>Lead-Free</u>	RoHS Directive EU/2015/863; amending Annex II of 2011/65/EU

APPLICATION GUIDELINES

Formulated for both standard and fine pitch stencil printing, at print speeds of between 12.5mm/sec (0.5"/sec) and 50mm/sec (2"/sec), with stencil thicknesses of 0.08mm (0.003") to 0.15mm (0.006"), particularly when used in conjunction with ALPHA FORM (Electroformed Stencils) or ALPHA CUT (Laser Cut Stencils). Blade pressures should be 0.16 to 0.34 kg/cm of blade (0.9 to 2lbs/inch), depending upon the print speed. The higher the print speed employed the higher the blade pressure that is required. The reflow process window will give high soldering yield with good cosmetics and minimized rework.

TECHNICAL DATA

Category	Results	Procedures/Remarks
Physical Properties		
Activity Level	ROL0 = J-STD Classification	IPC J-STD-004
Halide Content	Halide free (by titration).	IPC J-STD-004
Ag Chromate Test	Pass	IPC J-STD-004
Copper Mirror Test	Pass	IPC J-STD-004
Copper Corrosion Test	Pass	IPC J-STD-004
	Pass	JIS Z 3197-1986
Bono Corrosion Test	Pass	Bono test procedure
Talc Test	Pass, (No powder attachment)	JIS Z 3197

Category	Results	Procedures/Remarks
Electrical Properties		
SIR (IPC 7 days @ 85 °C /85% RH)	Pass , 2.2×10^{10} ohms	IPC J-STD-004 {Pass $\geq 1 \times 10^8$ ohm min}
SIR (Bellcore 96 hours @ 35 °C/85%RH)	Pass , 9.5×10^{11} ohms	Bellcore GR78-CORE {Pass $\geq 1 \times 10^{11}$ ohm min}
SIR (JIS 168 hours @ 40 °C/93%RH)	$>1.0 \times 10^{12}$ ohms	JIS Z 3197 (No P/F limit)
Electromigration (Bellcore 96 hours @ 65 °C/85%RH 10V 500 hours)	Pass , Initial = 2.0×10^{10} ohms Final = 1.8×10^{10} ohms	Bellcore GR78-CORE {Pass = final $>$ initial/10}
Electromigration (JIS 1000 hours @ 85 °C/85%RH 48V 1000 hours)	Pass , Initial = 2.3×10^{10} ohms Final = 4.7×10^{10} ohms No migration after 1000hrs	JIS-Z-3197-1999
Physical Properties		Using 88.8% Metal, Type #5 Powder.
Color	Clear, Colorless Flux Residue	SAC 305 alloy
Tack Force vs. Humidity (t=8 hours)	Pass $<10\%$ change over 100 gf after 24 when stored at 25 ± 2 °C and $50 \pm 10\%$ RH.	JIS Z3284 Annex 9
Viscosity	88.8% metal load designated M19 for Type 5 89.0% metal load designated M19 for Type 4 84% metal load designated M05 (dispense grade) for Type 5	Malcom Spiral Viscometer; J-STD-005
Solder ball	Acceptable (SAC 305 alloy) Tested after 4hours storage @ 25%, 50% and 85% RH.	IPC TM-650
Stencil Life	8 hours	25 °C (77 °F)
Spread	Pass 82 %	JIS-Z-3197: 1999 8.3.1.1
Hot Slump	Pass	IPC J-STD-005 (10 min 150 °C)
	Pass No bridge for 0.2mm space	JIS-Z-3284-1994 Annex 8

PROCESSING GUIDELINES

Storage-Handling	Printing	Reflow (See Figure #1)	Cleaning
<ul style="list-style-type: none"> 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 20 days at temperatures up to 25 °C <u>without opening the jar seal.</u> When refrigerated, warm up 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 of printer. 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. These are starting recommendations and all process settings should be reviewed independently 	<p><u>Stencil:</u> Recommend ALPHA FORM Electroform Stencil or ALPHA CUT Laser Cut Stencil @ 0.08mm (0.003”) to 0.15 mm (0.006”) thick for 0.3 or 0.5 mm (0.012” or 0.020”) pitch</p> <p><u>Squeegee:</u> Metal (recommended)</p> <p><u>Pressure:</u> 0.9 to 2.0 lbs./inch of squeegee length (0.16 to 0.34 kg/cm).</p> <p><u>Speed:</u> 12.5 to 50mm per second (0.5 to 2 inches per second).</p> <p><u>Paste Roll:</u> 1.5 to 2.0 cm diameter. Make additions when roll reaches 1-cm (0.4”) diameter (min). Max roll size will depend upon blade. “Exceeding the maximum diameter may cause curtaining (sticking to the squeegee when it is lifted from the stencil).”</p>	<p><u>Atmosphere:</u> Clean-dry air or nitrogen atmosphere.</p> <p><u>Profile (SAC305/405):</u> A straight ramp profile @ 0.7 to 2 °C per second ramp rate is recommended (TAL 45 to 90 sec and peak 235 to 245 °C)¹.</p> <p>Higher density assemblies may require preheating within the profile and may be accomplished as follows:</p> <ul style="list-style-type: none"> - Ramp @ 0.8 to 1.7 °C /sec. to 135 to 160 °C. - Slow ramp to 180 to 190 °C over 60 to 90 seconds. - Ramp @ 1 to 2 °C/sec to 235 to 250 °C peak temp. TAL = 35 to 90 seconds - Ramp down to R.T. @ 1 to 6 °C per second. <p>Note 1: Refer to component and board supplier data for thermal properties at elevated temperatures</p>	<p>ALPHA OM-325 residue is designed to remain on the board after reflow. If reflowed residue cleaning is required ALPHA BC-2200 cleaner can be used.</p> <p>Misprints and stencil cleaning may be done with ALPHA SM110, ALPHA SM-440 and ALPHA BC-2200.</p>

REFLOW PROFILES

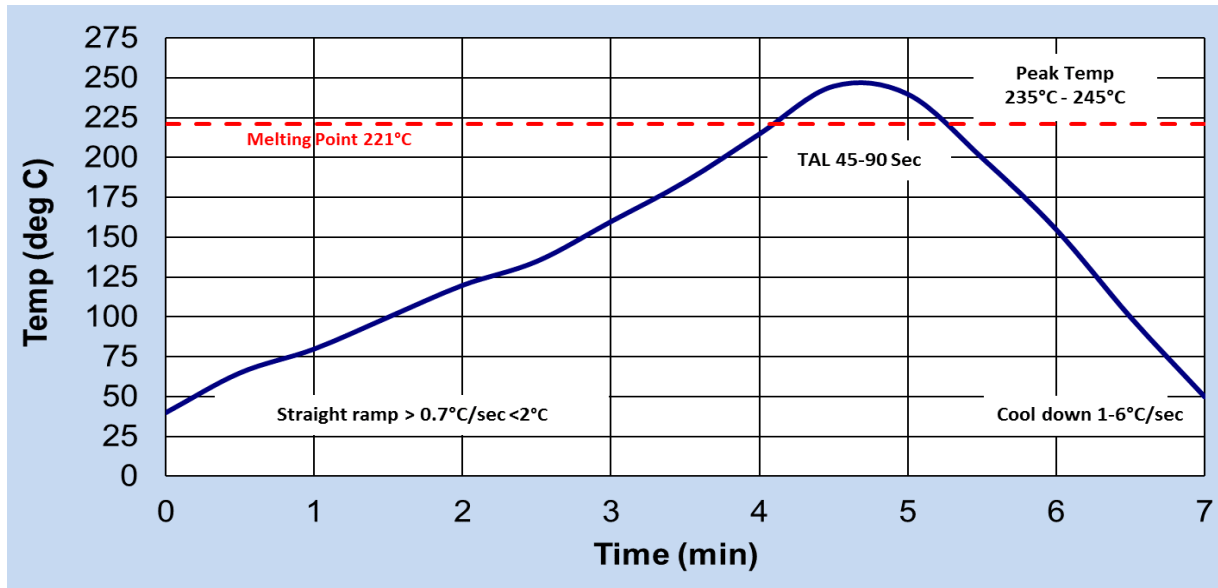


Figure 1: Suggested reflow profile

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 or [link here](#).



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 at MacdermidAlpha.com/assembly-solutions/knowledge-base.**

CONTACT INFORMATION

To confirm this document is the most recent version, please contact
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www.macdermidalpha.com

<p>North America 109 Corporate Blvd. South Plainfield, NJ 07080, USA 1.800.367.5460</p>	<p>Europe Unit 2, Genesis Business Park Albert Drive Woking, Surrey, GU21 5RW, UK 44.01483.758400</p>	<p>Asia 8/F., Paul Y. Centre 51 Hung To Road Kwun Tong, Kowloon, Hong Kong 852.3190.3100</p>
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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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