

ALPHA[®] OM-345 Solder Paste

High Reliability, Lead-Free, Zero-Halogen, No-Clean

DESCRIPTION

ALPHA OM-345 is a lead-free, halogen-free, no-clean solder paste designed for a broad range of applications. **ALPHA OM-345**'s broad processing window is designed to minimize transition concerns from tin/lead to lead free solder paste. This material is engineered to deliver lead free solder with a very high level of electrical reliability. **ALPHA OM-345** yields excellent print capability performance across various board designs and, particularly, with ultra fine feature repeatability (11 mil Squares) and high "through-put" 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-345** is formulated to deliver excellent visual joint cosmetics. Additionally, **ALPHA OM-345**'s capability of IPC Class III for voiding and ROL0 IPC classifications ensures maximum long-term product reliability.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Maximizes reflow yield for lead-free processing, allowing full alloy coalescence at circular dimensions as small as 0.275mm (0.011in) with 0.100mm (4mil) stencil thickness
- Excellent print consistency with high process capability index across all board designs
- Print speeds of up to 150mm/s (6in/s) 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
- Halogen free
- Compatible with either nitrogen or air reflow

PRODUCT INFORMATION

<u>Alloys:</u>	SAC305 (96.5%Sn/3.0%Ag/0.5%Cu) SAC405 (95.5%Sn/4.0%Ag/0.5%Cu) For other alloys, contact your local Alpha Sales Office.
<u>Powder Size:</u>	Type 3, (25 to 45µm per IPC J-STD-005)
<u>Residues:</u>	Approximately 5% by (w/w)
<u>Packaging Sizes:</u>	500 gram jars, 6in & 12in cartridges, DEK ProFlo™ cassettes, and 10cc and 30cc dispense syringes.
<u>Flux Gel:</u>	ALPHA OM-345 Flux Gel - available in 10cc & 30cc syringes for rework applications-
<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 25mm/s (1in/s) and 150mm/s (6in/s), with stencil thickness of 0.100mm (0.004in) to 0.150mm (0.006in), particularly when used in conjunction with ALPHA Stencils. Blade pressures should be 0.18 to 0.27 kg/cm of blade (1.0 to 1.5 lbs/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	Procedure/Remarks
Chemical Properties		
Activity Level	ROL-0 = J-STD Classification	IPC J-STD-004A
Halide Content	Not Detected (MDL 50ppm)	JPCA-ES01:2003
Copper Mirror Test	Pass	IPC J-STD-004A
Copper Corrosion Test	Pass	IPC J-STD-004A; JIS-Z-3197 (8.4.1)
Electrical Properties		
SIR (IPC 7 days @ 85 ° C /85% RH)	Pass , 5.4 x 10 ⁹ ohms	IPC J-STD-004A {Pass ≥ 1 x 10 ⁸ ohm}
SIR (Bellcore 96 hrs @ 35 °C /85%RH)	Pass , 4.4 x 10 ¹¹ ohms	Bellcore GR78-CORE {Pass ≥ 1 x 10 ¹¹ ohm}
Electromigration (Bellcore 96 hrs @ 65 °C/85%RH 10V 500 hrs)	Pass , Initial = 9.4 x 10 ⁸ ohms Final = 8.3 x 10 ⁹ ohms	Bellcore GR78-CORE {Pass=final > initial/10}
Bono Corrosion- 15 days @ 85 °C/85%RH 20V	Pass , Corrosion Factor = 1.2	{Pass=Corrosion Factor < 10}
Physical Properties		
Color	Clear, colorless Flux Residue	SAC 305, 405 alloy
Tack Force vs. Humidity (t=8 hours)	Pass -Change of <1 g/mm ² over 24 hrs at 25% and 75% Relative Humidity	IPC J-STD-005
Viscosity	88.5% metal load designated M16 for printing.	Malcom Spiral Viscometer; J-STD-005
Solderball	Acceptable (SAC 305 & SAC405 alloys)	IPC J-STD-005
Stencil Life	> 8 hours	@ 50%RH, 23 °C (74 °F)
Spread	NA	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)
	No bridging 0.2 mm gap & above	DIN Standard 32 513, 5.3
	No bridging 0.5 mm gap & above	JIS Z 3284:1994 Annex 8

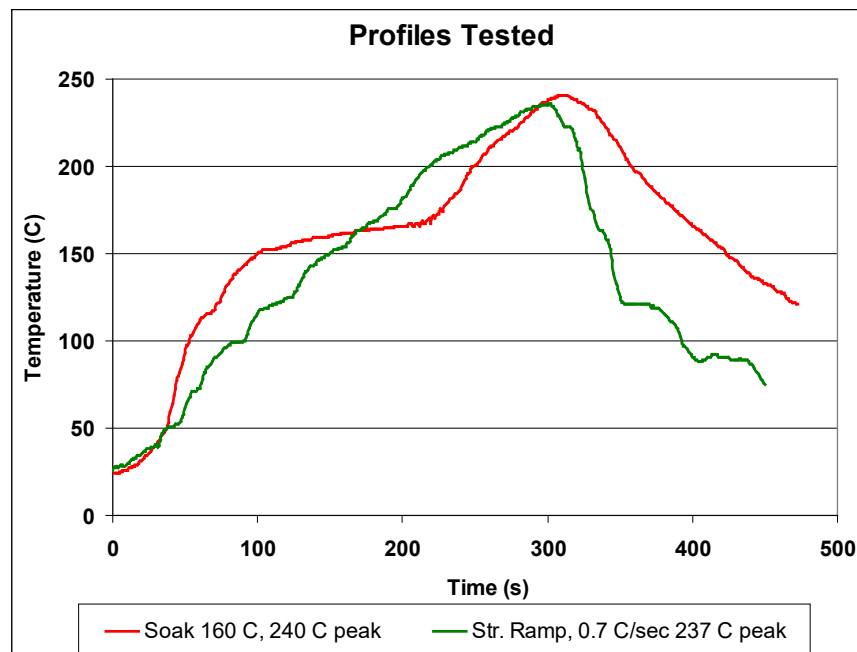
PROCESSING GUIDELINES

Storage & Handling	Printing	Reflow	Cleaning
<ul style="list-style-type: none"> Refrigerate to guarantee stability @ 0 to 8 °C (32 to 46 °F) Shelf life of refrigerated paste is six months. 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. These are starting recommendations and all process settings should be reviewed independently. 	<p><u>Stencil:</u> Recommend ALPHA CUT or ALPHA FORM stencils @ 0.100 to 0.150 mm (4 to 6 mil) thick for 0.4 to 0.5 mm (0.016in or 0.020in) pitch. Stencil design is subject to many process variables. Contact your local Alpha stencil site for advice.</p> <p><u>Squeegee:</u> Metal (recommended)</p> <p><u>Pressure:</u> 0.18 to 0.27 kg/cm of squeegee length (1.0 to 1.5 lbs./inch).</p> <p><u>Speed:</u> 25 to 150mm per second (1 to 6 inches per second).</p> <p><u>Paste Roll:</u> 1.5 to 2.0 cm diameter and make additions when roll reaches 1-cm (0.4in) diameter (min). Max roll size will depend upon blade.</p>	<p><u>Atmosphere:</u> Clean-dry air or nitrogen atmosphere.</p> <p><u>Profile (SAC Alloys):</u> Acceptable reflow / coalescence for feature size down to 11 mil (280 um) and IPC Class III voiding obtained for the profiles depicted below.</p> <p><u>Soak Profile:</u> Soak: 155 to 175 °C, 60 to 100 sec soak profiles have been determined to give optimal results</p> <p>Note 1: 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>ALPHA OM-345 residue is designed to remain on the board after reflow. If reflowed residue cleaning is required,</p> <p>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 - Bioact™ SC-10E - Kyzen Micronox MX2501 <p>Misprints and stencil cleaning may be done with ALPHA SM-110E, ALPHA SM-440, ALPHA BC-2200 and Bioact™ SC-10E cleaners.</p>

REFLOW PROFILES

Parameter	Guideline	Additional Information
Atmosphere	Air or N ₂	Mass production verification both in air and N ₂ .
SnAgCu alloy melting ranges. Lower temperature=solidus; higher temperature = liquidus	SAC305: 217 to 220 °C SAC405: 217 to 225 °C SAC387: 217 to 220 °C	Use for reflow above liquidus setting

Profile General Guideline (Typical for SAC305)		
Setting Zone	Optimal Dwell Period	Extended window
40 to 220 °C	3 min to 3:15	< 4 min.
130 to 220 °C	1:30 to 1:40	< 3 min.
170 to 220 °C	1 min.	< 2 min.
Above 220 °C	45 to 90 sec.	30 to 90 sec.
Peak temp.	< 240 °C for OSP finish	No limit to other surface finish
Joint cool down rate from 170 °C	> 3 to 8 °C	Recommended to prevent surface cracking issue.



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.**

STORAGE

ALPHA OM-345 should be stored in a refrigerator upon receipt at 0 to 10 °C (32 to 50 °F). ALPHA OM-345 should be permitted to reach room temperature before unsealing its package prior to use. This will prevent moisture condensation build up in the solder paste.

CONTACT INFORMATION

To confirm this document is the most recent version, please contact Assembly@MacDermidAlpha.com

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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