ALPHA® OM-338-T45 Solder Paste

Ultra-Fine Feature, Lead-Free

DESCRIPTION

ALPHA OM-338-T45 is a lead-free, no-clean solder paste designed for fine feature lead free SMT processing. **ALPHA OM-338-T45** was developed to enable 0.4mm pitch BGA package assembly. Its high tack, and tolerance for high print speeds make it a unique paste for high volume, ultra-low defect requirements.

Outstanding reflow process window delivers good soldering on CuOSP with excellent coalescence on a broad range of deposit sizes. **ALPHA OM-338-T45** offers high paste volume transfer, and low volume transfer variability without sacrificing voiding or random solder ball defects. Clear, colorless flux residue also makes **ALPHA OM-338-T45** a popular choice. **ALPHA OM-338-T45** is formulated to deliver excellent visual joint cosmetics. Additionally, **ALPHA OM-338-T45**'s capability of IPC Class III for voiding and ROL0 IPC classifications ensures maximum long-term product reliability. In addition, **ALPHA OM-338-T45** contains 0 halogen.

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 0.24mm (0.0096in) with 0.100mm (4mil) stencil thickness.
- Excellent print consistency with high process capability index across all board designs.
- Print speeds of up to 175mm/s (7in/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
- Compatible with either nitrogen or air reflow
- Zero-halogen Content

PRODUCT INFORMATION

Alloys:	SAC405 (95.5%Sn/4.0%Ag/0.5%Cu) e1 alloys per JESD97 Classification For other alloys, contact your local Cookson Electronics Sales Office.
Powder Size:	Type 4.5
Residues:	Approximately 5% by (w/w)
Packaging Sizes:	Printing Grade-500 gram jars, 6 or 12 inch Semco Cartridges, DEK Proflow 800 gram cassette
Dispense Grade For Rework:	83.3% Metal Loading. Malcolm Viscosity (10 RPM, 25 °C) M04. 10cc and 30cc syringes
Lead Free:	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 175mm/s (7in/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 0.16 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
Chemical Properties		
Activity Level	ROL-0 = J-STD Classification	IPC J-STD-004
Halide Content	Halide free (by titration). Passes Ag Chromate Test	IPC J-STD-004
Copper Mirror Test	**Pass**,	IPC J-STD-004
Copper Corrosion Test	**Pass**, (No evidence of Corrosion)	IPC J-STD-004
Electrical Properties		
SIR (IPC 7 days @ 85 °C/85% RH)	**Pass**, > 1.9×10^{10} ohms	IPC J-STD-004 {Pass ≥ 1×10^{8} ohm min}

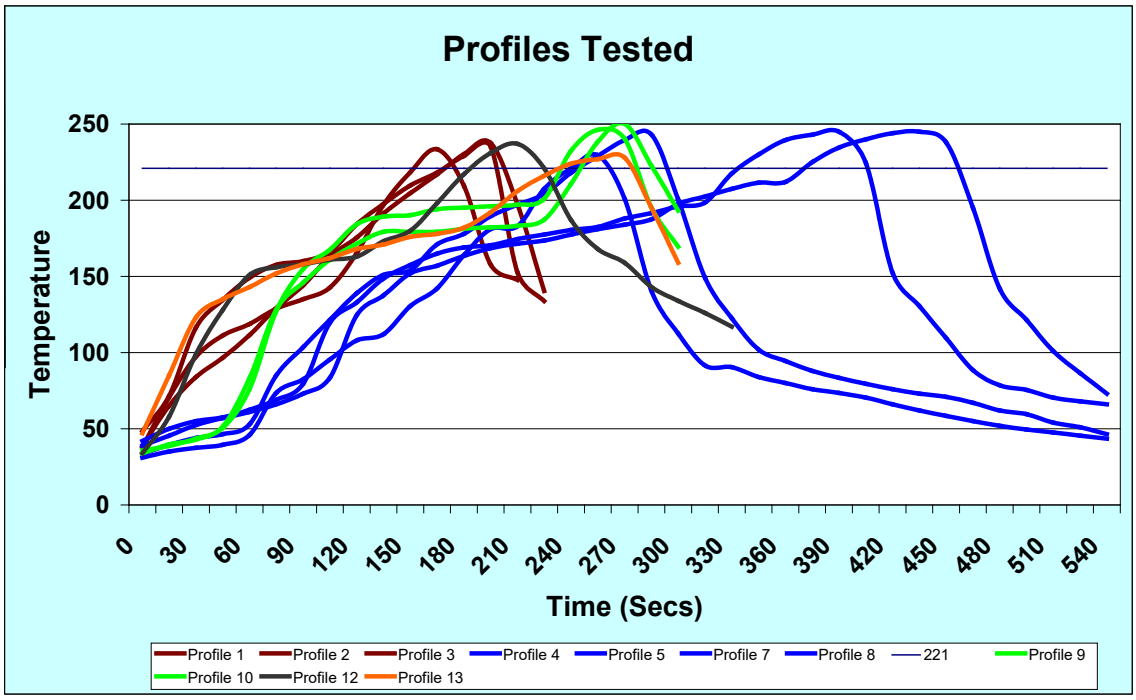
Category	Results	Procedures/Remarks
SIR (Bellcore 96 hours @ 35 °C/85%RH)	**Pass**, 8.3 x 10^{12} ohms	Bellcore GR78-CORE {Pass ≥ 1 x 10^{11} ohm min}
Electromigration (Bellcore 96 hours @ 65 °C/85%RH 10V 500 hours)	**Pass**, Initial= 5.3 x 10^{10} ohms Final= 1.5 x 10^{11} ohms	Bellcore GR78-CORE {Pass=final > initial/10)
Physical Properties		**Using 88.3% Metal, Type #4.5 Powder.**
Color	Clear, Colorless Flux Residue	SAC 405 alloy
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
	Pass -Change of <10% when stored at 25±2°C and 50±10% relative humidity.	JIS Z 3284 Annex 9
Viscosity	OM-338-T45: 88.3% metal load designated M12 for printing. 83.3% metal load designated M04 for dispensing.	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
Stencil Life	> 8 hours	@ 50%RH, 23 °C (74 °F)
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

PROCESSING GUIDELINES

Storage-Handling	Printing	Reflow (See Figure #1)	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 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.	**Stencil:** 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. **Squeegee:** Metal (recommended) **Pressure:** 0.16 to 0.34 kg/cm of squeegee length (0.9 to 2.0 lbs./inch). **Speed:** 25 to 200mm per second (1 to 8 inches per second). **Paste Roll:** 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. Compatible with DEK Proflow 800 gram cassette. "Exceeding the maximum diameter may cause curtaining (sticking to the squeegee when it is lifted from the stencil)."	**Atmosphere:** Clean-dry air or nitrogen atmosphere. **Profile (Sac Alloys):** A straight ramp profile @ 0.8 to 1.7 °C per second ramp rate is recommended (TAL 35 to 90 sec and peak 232 to 250 °C) [1.] Higher density assemblies may require preheating within the profile and may be accomplished as follows: - Ramp @ 0.8 to 1.7 °C/sec. to 135 to 160 °C. - Ramp from 130 °C to liquidus over 60 to 90 seconds. - Ramp from 150 °C to liquidus over 30 to 60 seconds. - Time above liquidus = 35 to 90 seconds - Ramp down to R.T. @ 3 to 7 °C per second (fast ramp down is recommended) 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.	ALPHA OM-338-T45 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: - ALPHA SM-110E - Bioact™ SC-10E - Kyzen Micronox MX2501 Misprints and stencil cleaning may be done with ALPHA SM-110E, ALPHA SM-440, ALPHA BC-2200 and Bioact™ SC-10E cleaners.

REFLOW PROFILES

Figure #1 – Reflow Envelope



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-338-T45 should be stored in a refrigerator upon receipt at 0 to 10 °C (32 to 50 °F). Paste should be permitted to reach room temperature before unsealing its package prior to use (see handling procedures on page 4). 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

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

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